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[ORIGINAL COMMUNICATION.]

PREPARATION OF VOLUMETRIC SOLUTIONS.

BY

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As an outfit for volumetric analysis and for the preparation of the standard solutions required for it, the pharmacist needs but little apparatus in addition to that in daily use in his business. If he desires to limit himself to the absolutely indispensable articles and buy but a single *burette*, he should select one with a glass stopcock of 50 C.c. contents, divided into $\frac{1}{10}$ C.c. This is serviceable for all purposes. A single holder of wood or metal is needed to keep it in position. A somewhat cheaper but much less commodious substitute for this may be found in Bink's pouring burette, on a wooden foot, which is not only cheaper than the ordinary burette, but saves, in addition, the expense of a holder. Whenever a second burette can be afforded, it should be one with rubber tube and Mohr's spring clamp, which is much more convenient to handle than any other, but unfortunately cannot be used for such solutions as are affected by contact with rubber, such as silver nitrate, iodine, or potassium permanganate.

Besides the burette, a *pipette* with mark on neck to deliver 10 C.c. is indispensable. A second one of 25 C.c. will prove very useful. Whoever wishes to provide himself more abundantly will find good use for a graduated pipette with the cubic centimeters divided into tenths, but this may be readily dispensed with.

Whoever expects to buy his volumetric solutions ready-made needs no other apparatus. But such a plan would be as little advisable as that of buying paregoric and laudanum ready-made. It is generally both safer and more profitable to prepare the standard solutions than to buy them. For that purpose a few additional pieces of apparatus are needed. Most important among them is a *liter flask* with mark on the narrow neck for 1,000 C.c. A very convenient improvement is a double mark, the lower one indicating 1,000 C.c. received, the upper the same quantity delivered, the difference being the amount of liquid adhering within the bottle after emptying. Another flask with mark on neck for 500 C.c. and a third for 100 C.c. are very useful additions, but can be dispensed with. But an almost indispensable article, which is also very useful in examination of ether, amyl nitrite, chloroform, etc., is a small, *graduated, glass-stoppered cylinder* of 100 C.c. contents, divided into single cubic centimeters. A larger mixing cylinder, containing 1,000 C.c. or more, and graduated in quantities of 10 C.c., is very useful, but not absolutely necessary.

The absolutely indispensable outfit, therefore, consists of:

1 burette with glass stopcock, 50 C.c., divided into tenths	$2.70
1 burette holder (or, instead of both, a Bink's burette)	1.35
1 pipette with mark on neck at 10 C.c.	$0.25
1 liter flask, 1,000 C.c. mark on neck (or two marks).	1.10
1 graduated cylinder, 100 C.c., divided into tenths...	1.20
Total	$6.60

Additional apparatus for a complete outfit:

1 burette, 50 C.c., with Mohr's spring clamp	$1.75
1 pipette, 25 C.c. mark on neck	.40
1 half-liter flask, 500 C.c. mark on neck	.75
1 tenth-liter flask, 100 C.c. " " "	.45
1 mixing cylinder, 1,000 C.c., in tenths C.c.	3.00
Price of complete outfit	$12.95

Of this price $2.20 may yet be saved by substituting the Bink burette.

It is evident that the question of cost alone will prevent but few pharmacists from preparing themselves to test their chemicals by the volumetric method. The necessary manipulations are not difficult to acquire and may be learned in a short time. The calculations will offer no difficulty when the Pharmacopœia serves as a guide; hence the only point to consider is whether the preparation of the standard volumetric solutions requires much outlay in money or unusual skill.

For pharmaceutical examinations about 11 volumetric solutions are in use, and a single liter of most of them, when carefully husbanded, suffices for 30 to 40 tests None of the solutions require a large amount of costly material, and but few are more difficult to prepare than one of the ordinary prescriptions which are daily brought to the counter.

To make, for example, 1 liter of decinormal solution of silver nitrate, 16.96 Gm. of the pure, dry salt are weighed out, placed into the liter flask, and dissolved in distilled water of about 15° C., sufficient to fill the bottle to the 1,000 C.c. mark. As the surface of the liquid is not a level, but is drawn upward by adhesion wherever it touches the sides of the narrow neck of the bottle, the filling is done so that the lowest point of the curved surface coincides with the mark. According to the position of the observer, the flask is seen either on a light or a dark background, or against a piece of white paper held behind it, which reflects the light through the flask and contents; but whatever appearance the curved surface of the liquid shows in arrangement of light and shade, the lowest margin of the curve is taken as the guide index. (*See page* 18.)

In the use of pipettes, burettes, and mixing cylinders, the same rule is observed, and that mark of the graduation which coincides with the lowest part of the curve is read off. The narrower the tube, the more accurate will the observation be; the wider, the less accuracy can be obtained. Hence, whenever there is a choice in the use of vessels, the liter flask with narrow neck is preferable to the wide mixing cylinder, the pipette with narrow tube to the wider tube of the burette, etc. The silver solution when prepared is best preserved in small glass-stoppered bottles and protected carefully against dust and organic matter. Light will decompose it only when it is in contact with organic matter, etc. A mistake is often made in the filling of bottles, flasks, burettes, or pipettes, which injures the solutions, however carefully prepared. To get the vessels quite clean, they are thoroughly rinsed with distilled water, and the fact is lost sight of that distilled water is itself an impurity as regards volumetric solution. For if a flask or other vessel is filled while the inside is moist, the solution is thereby diluted. Hence the vessel must either be thoroughly dried, or, much better, must be rinsed once or twice with a small portion of

the liquid it is to receive. After such rinsing it is clean for that particular liquid. This occasions but a small loss of the solution, and protects against errors and uncertainty. If the solid to be used in the volumetric solution is easily obtained pure and of constant composition—not subject to change in attraction of moisture or loss of water of crystallization—there is no difficulty in preparing from it the standard solution. The calculated molecular quantity is weighed out, placed in the liter flask, and dissolved in the menstruum (distilled water) at about 15° C., so as to fill the flask up to the desired mark. Sometimes a second or third is introduced, but the method remains the same as in making the decinormal solution of silver nitrate. Thus, 1 liter of the solution contains of:

Oxalic acid, normal, 63 Gm. of pure crystals.

Oxalic acid, decinormal, 6.3 Gm.

Iodine, decinormal, 12.66 Gm., and 18 Gm. potassium iodide.

Sodium hyposulphite, decinormal, 24.76 Gm.

Sodium chloride, decinormal, 5.84 Gm.

Potassium bichromate, decinormal, 14.7 Gm.

Fehling's solution, 34.64 Gm. of cupric sulphate in half a liter, and 173 Gm. of Rochelle salt and 125 Gm. of dry potassium hydrate dissolved in another half liter. Both are kept separate, and, when needed, mixed in equal volumes.

Mayer's solution of mercuric potassium iodide is made by dissolving 13.546 Gm. of mercuric chloride and 49.8 Gm. of potassium iodide in water sufficient to make 1 liter.

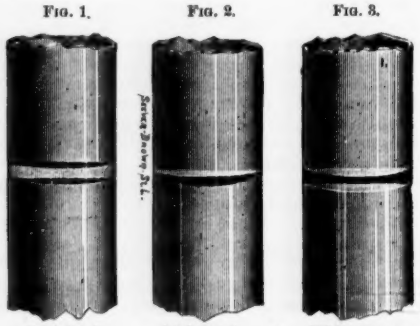


Fig. 1. Dark background.

Fig. 2. Light background.

Fig. 3. White paper behind tube.

A little more difficulty is experienced in preparing other solutions—for example, normal potassium or sodium hydrate, normal sulphuric or hydrochloric acid, etc., as these substances are not found in conditions of sufficiently constant strength to permit direct weighing. The acids are more or less concentrated solutions of real acid in water. The alkaline hydrates absorb moisture and cannot, therefore, be relied upon. On the other hand, in the preparation of the standard solution of potassium permanganate, the distilled water may contain gases or other substances absorbed from the atmosphere, which decompose a small amount of the permanganate and render it unstable. Hence the general method followed for preparing volumetric solutions of these and similar bodies is to make the solution more concentrated than necessary and adjust it to the proper standard (titre) by dilution, so as to correspond to another equivalent solution which is used as a standard of comparison.

Thus, to prepare *normal solution of potassium hydrate*, 75 Gm. of the best white commercial potassa are weighed out (instead of 56 Gm. of pure KOH, necessary for 1 liter) and dissolved in somewhat more than 1 liter (about 1,050 C c.) of distilled water contained in an ordinary bottle of sufficient size. With a few cubic centimeters of this solution (which is much stronger than normal) the 50 C.c. burette is now rinsed out, about 25 C.c. of the same are then poured in. By rapid opening and closing of the stopcock the jet below it is filled so as to contain no air bubbles, and the height of the liquid in the burette is read off by the graduation and noted.

A small amount of normal solution of oxalic acid is then made by dissolving 6.3 Gm. of pure crystallized oxalic acid in enough distilled water to make 100 C.c. Of this, 10 C.c. are measured out with a carefully rinsed pipette and permitted to flow into a small flask with wide neck, of about 100 C.c. contents, which has been washed with distilled water. A few drops of the solution of phenolphthalein (or other indicator) are added and the flask placed under the burette. From this the concentrated potassa solution is added in small portions and the flask shaken to mix the contents. At the place of influx of the alkali they assume a red color, which disappears on shaking, so long as the acid is not completely saturated. At last the addition of a single drop of potassa solution, more than necessary to saturation, produces a red color, which does not again disappear on shaking the flask. If too much has been added, the color will be a deep blood red instead of a pale pink, and another trial must be made. The strength (or titre) of the potassa solution is thus ascertained. Were it strictly normal, 10 C.c. would exactly saturate the 10 C.c. of normal oxalic acid, and a single drop in excess would render the mixture alkaline and reddent he phenolphthalein. If instead of this a less number of cubic centimeters were sufficient (*e.g.*, 8 C.c.), these 8 C.c. then contain as much KOH as should be contained in 10 C.c., and must therefore be diluted to 10 C.c. with distilled water. For the whole amount of the residue the proportion is then calculated by the following: 8 : 10 :: 1,000 : x, x = 1,250. One liter must then be diluted to 1,250 C.c. The residue is therefore poured into the liter flask, and exactly 1,000 C.c. measured out and poured into a larger bottle ; 250 C.c. of distilled water are also measured out and added to this, and the whole amount thoroughly mixed. Another test is now made with this mixture, which is placed in the burette (first rinsed with it) and added to normal oxalic acid and phenolphthalein as before. Fifty C.c. of the acid are taken this time, and, on addition of 50 C.c. of the diluted potassa solution from the burette, should remain colorless, while a single drop more should color the liquid red. If this be the case, the liquid is now correctly standardized, and is preserved as *normal potassium hydrate solution*. If not exactly corresponding, the liquid is again adjusted by addition of water if yet too strong, or of the concentrated potassa solution remaining from the first trial, if too weak. Or the small error is noted on the label and used as correction in subsequent work. If the work has been carefully done, the liquid will be correct and need no further changes.

The adjustment may also be made by reversing the conditions—*i.e.*, placing the normal oxalic acid in the burette and measuring the potassa solution by means of the pipette into the flask. The phenolphthalein solution then added colors the potassa a deep blood red, and oxalic acid is added until the last drop just discharges the color. In the foregoing example 10 C.c. of potassa solution would have required exactly 12.5 C.c. of normal oxalic acid, and the calculation for diluting would have given the same results. Instead of the solution of phenolphthalein, litmus tincture, methyl orange, or other indicators may be used.

But why prepare, of the concentrated solution above mentioned about 1,050 C.c. instead of exactly 1 liter? There is a good reason for this. For rinsing the burette a certain quantity, not exactly measured, is used, and for one or two tests 10 or 20 C.c. more. Hence, if exactly 1 liter of the solution had been prepared, a residue, not exactly measured, of about 970 or 980 C.c. would remain. Even if the operator were in possession of a mixing cylinder, accurate measurement of smaller amounts than 5 C.c. would not be very practicable; while if somewhat more may be measured in the liter flask with great accuracy, than 1 liter was made at first, 1,000 C.c. of the residue left and the water necessary for dilution added to this by measuring either with a 100 C.c. flask or 100 C.c. graduated cylinder, or both. The little surplus left may be made serviceable if by some inadvertence the mixture has become a little too much diluted, or may even be rejected without great loss. In exactly the same manner *normal solution of sodium hydrate* is made.

With the aid of the accurate normal solution of potassium hydrate thus prepared, the solution of sulphuric or hydrochloric acid may now be adjusted by applying the same method. For *normal sulphuric acid*, containing 48.9 Gm. of H_2SO_4 in 1,000 C c., about 55 Gm. (30 C.c.) of the strong, commercial oil of vitriol are taken, which con-

tains about 98 per cent of pure H_2SO_4, and this is cautiously mixed with a little more than 1 liter of water and permitted to cool to about 15 C.° The strength of this trial acid is ascertained, in the manner above described, with normal potassium hydrate, and in accordance with the result the remaining bulk of the acid is diluted with the necessary volume of distilled water.

For *normal hydrochloric acid* containing 36.4 Gm. of HCl in 1 liter, about 150 Gm. (130 C.c.) of the concentrated acid of commerce, containing about 32 per cent of HCl, are diluted to about 1,050 C.c. A sample is tested with normal potassium hydrate solution, and the bulk of the residue diluted in accordance with the result.

Normal oxalic acid, containing 63 Gm. of $H_2C_2O_4 + 2H_2O$, is easily made by weighing the crystals of the pure acid and dissolving in distilled water sufficient to make 1 liter at 15° C. This solution serves an excellent purpose, if used at once after pouring into the burette, but if left standing the titre changes from evaporation, and crystals form in the jet, as the normal solution is nearly saturated and therefore very prone to crystallize. It is therefore prepared in normal strength $\left(\frac{N}{1}\right)$ only in small quantities for immediate use, but in decinormal strength $\left(\frac{N}{10}\right)$ it forms a useful companion to the potassium permanganate, and, if carefully preserved, does not readily deteriorate. Instead of normal oxalic acid, normal sulphuric or hydrochloric acid is kept on hand.

Potassium permanganate in *decinormal* solution is of great value for the titration of ferrous preparations, oxalic acid, oxalates, etc. But as ordinarily prepared its usefulness is impaired by a slow but constant decrease of strength (titre) occasioned by reducing agents, either contained in the impure salt or in the water. Hence its preparation by direct weighing and solution of 3.14 Gm. of potassium permanganate implies the irksome necessity of ascertaining the strength (taking the titre) immediately before each examination made by its means. To obviate this tendency to change, and to furnish a solution which, if carefully preserved, will hold titre for months, it is best to make two solutions in boiling water, one stronger, the other weaker than the standard, letting them stand for forty-eight hours to deposit sediment, then ascertaining the strength of each by decinormal oxalic acid solution and mixing them in such proportions, ascertained by calculation, as will produce a solution exactly corresponding in strength to the decinormal oxalic acid.

The mode of preparation is as follows: To make the weaker solution 6.6 Gm. of $KMnO_4$ are dissolved in about 2,200 C.c. of boiling distilled water kept boiling for fifteen minutes, and set aside in a well-stoppered vessel for two days to deposit whatever sediment may form. The clear portion is then carefully decanted. For the stronger solution 3.5 Gm. of $KMnO_4$ are dissolved in 1 liter of boiling water and treated in like manner as the weaker solution. Each one of the solutions is then separately tested with decinormal oxalic acid containing 6.3 Gm. of $H_2C_2O_4 + 2H_2O$ in 1 liter, and the strength noted. For this purpose 10 C.c. of decinormal oxalic acid are brought into a suitable flask and 1 C.c. of concentrated sulphuric acid added. Before this mixture cools, one of the permanganate solutions is added from a burette in small portions. After every addition the flask is shaken, and, in case of cooling too much, heated over a lamp. The red color produced by the addition of the first portion of permanganate disappears somewhat slowly on shaking the flask, the subsequent additions do not require so much time, until finally a very slight excess produces a permanent pink color. The number of cubic centimeters of permanganate used to oxidize the 10 C.c. of decinormal oxalic acid is now read off and noted. The strength of the second permanganate is ascertained in like manner. An easy calculation now determines the amount of each solution necessary to make the mixture exactly of standard strength.

The following may serve as an example: The equivalent of the 10 C.c. of oxalic acid has been 10.5 C.c. of the weaker and 9 C.c. of the stronger acid. From the volume of the weaker solution (10.5 C.c.) deduct 10. The difference (0.5) is to be multiplied by the number of cubic centimeters of the stronger solution (9 C.c.). The product is 0.5×9 C.c., or 4.5 C.c. *This is the number of cubic centimeters to be taken of the stronger solution.* Next the number of cubic centimeters of the stronger solution needed to decompose 10 C.c. of oxalic acid (9 C.c.) is deducted from 10. With the difference (1) the number of cubic centimeters of the weaker solution (10.5) is multiplied, and yields ($1 \times 10.5 = 10.5$ C.c.) the *number of cubic centimeters of weaker solution to be taken.* If now 4.5 C.c. of the strongersolution are mixed with 10.5 C.c. of the weaker solution, 15 C.c. of standard decinormal solution are obtained, which will exactly decompose an equal volume of oxalic acid $\left(\frac{N}{10}\right)$. Or multiply by 100, it will require 450 C.c. of the stronger and 1,050 C.c. of the weaker to make 1,500 C.c. of standard solution. In the present case we gave enough to take 2,100 C.c. of the weaker and 900 C.c. of the stronger solution to make 3 liters of standard solution The finished solution is then preserved in small, glass-stoppered bottles protected from dust and light.

For special purposes other solutions coming into occasional use need not be kept on hand, but are made as required. Thus, if the purity of certain oils is to be tested by the "*iodine number*," an equal volume of two solutions is mixed just as needed. One contains 5 Gm. of iodine in 100 C.c. of 94-per-cent alcohol, the second contains 6 Gm. of mercuric chloride in 100 C.c. of 94-per-cent alcohol.

For determination of the available chlorine in bleaching powder, etc., a *decinormal solution of sodium arsenite* is made by dissolving 4.95 Gm. of pure arsenic trioxide (anhydrous arsenious acid) in a sufficient amount of liquor sodæ and diluting with water to 1,000 C.c.

From these remarks it may be easily seen that neither the outfit for volumetric analysis nor the preparation of the necessary standard solutions will require a great deal of money or troublesome work. It is therefore very desirable that the useful and easily managed method of volumetric analysis should become more and more familiar to the pharmaceutical profession.

Notes on Essential Oils and their Derivatives.*

Oil of Elecampane.—The solid constituent of this oil, known as helenin (or helenic anhydride), which appears in form of crystals melting at 66° C., has been in considerable demand in Spain, where it is used as a remedy in cholera.

Oil of Angelica is in considerable demand for the American market. [It would be interesting to know what use is made of it besides as an ingredient in certain sauces and condiments.—ED. AM. DRUGG.]

Oil of Arnica.—Schimmel & Co. wonder what this expensive oil is used for. The larger proportion of all that is annually distilled—and this amounts to only a few pounds—is consumed abroad.

Oil of Betel Leaves, which has been favorably reported on as a remedy in diseases of the respiratory organs, will soon be available in larger quantities.

Oil of Camphor.—The *heavy* oil of camphor, which constitutes the fraction of the crude oil boiling between 240° and 300° C., and has a specific gravity of 0.970, is coming more and more into technical use.

It has a pale green color, and, though it is volatile, is of oily viscosity. It is difficultly inflammable, and therefore very safe (for instance, to replace benzin in printing offices). Like all ethereal oils, it is a disinfectant and antiseptic. It is capable of dissolving resins and even caoutchouc abundantly, and when added to varnishes renders them less brittle on drying.

It is very useful for covering the odor of mineral oils, axle grease, etc., without impairing their lubricating properties. It also is an excellent disguiser of the greasy odor of tallow and soap.

Oil of Cassia.—The correspondents of Schimmel & Co. at Hong Kong report that the Chinese have at last confessed the previously denied adulteration of oil of cassia with resin and mineral oils. Since unadulterated oil of

* From the October report of Schimmel & Co., Leipzig.

cassia has again reached the market, there would be no longer any occasion to discuss this matter, if the oil as now found in the market were of uniform quality. It will be advisable hereafter to purchase the oil only upon the amount of cinnamic aldehyde it contains. Schimmel & Co. have instructed an employee of a Hong Kong firm in the method of testing cassia oil, and are willing to do this to others, provided only that these firms will make the percentage of aldehyde the basis of their sale.

Schimmel & Co. have investigated the changes which oil of cassia undergoes when kept for some time exposed to air. They were led to this investigation by the claim of the bungling Hong Kong analyst who had been in the habit of certifying to the purity of the oil received for export, though this was largely adulterated with resin, he supposing that the resin was generated by age from the oil.

On September 20th, 1889, Schimmel & Co. exposed 200 C.c. of a pure oil of cassia in a flat dish covered only with perforated filtering paper, the layer of oil being about 1 Cm. high. The dish stood in a room exposed to the midday sun and heated during winter. The agents necessary for resinification—viz., air, heat, and light—were present in ample amount, more ample than is likely to happen to the oil in the market. The oil was examined on the first day and twice subsequently, with the following results:

	Residue left on distillation.	Cinnamic Aldehyde.	Cinnamic Acid.
September 20th, 1889...	5.5%	77.7%	0.7%
May 1st, 1890..... ...	10.6%	....	....
September 10th, 1890..	12.6%	68.5%	8.5%

The cinnamic acid was determined by shaking the oil with hot solution of soda. It was identified by its melting point (131°—that of the pure acid being 133°), and by forming benzaldehyde when oxidized with permanganate. On heating the oil with a solution of sodium bisulphite, for the purpose of determining the aldehyde, the cinnamic acid is dissolved at the same time and is converted into sodium phenylsulphopropionate (according to Valet). The pure acid is easily soluble in water, and may be extracted by ether after the solution has been acidulated with sulphuric acid. Since, then, the cinnamic acid is determined at the same time as the aldehyde, it is necessary to deduct from the latter an amount equivalent to the former. This has been done in the assays quoted above.

An examination of the figures shows that the proportion of cinnamic acid in the oil has increased during one year by about 8 per cent, the proportion of aldehyde has diminished 9 per cent, and the non-volatile residue has increased 7 per cent.

These figures show the fallacy of Mr. Niedhardt's (the Hong Kong analyst) theory that an amount of resin, up to 30 and 40 per cent, is formed in the oil by natural resinification.

In closed vessels oil of cassia remains unchanged. In open vessels it undergoes a slight resinification, but the genuineness or purity of the oil is recognized by the corresponding increase of cinnamic acid.

Schimmel & Co. once more give their method of determining the cinnamic aldehyde, but in a simplified form which may be followed even by inexperienced persons, as it does not involve any weighings.

The only articles necessary are: 1. A solution of bisulphite of sodium of about 30 per cent; 2. A pipette; 3. A water bath; 4. A small glass flask of the capacity of about 100 C.c., with a neck about 13 Cm. long and 8 Mm. calibre, which is graduated up to 6 C.c. in tenths. The process is as follows:

Measure off 10 C.c. of the oil with the pipette, transfer them to the flask, allow the pipette to drain a few minutes, and expel the last drop by blowing. Fill the flask about three-quarters full of the bisulphite solution, shake the mixture repeatedly and briskly, taking care that nothing is lost by spattering, and then put the flask into hot water (in the water bath), where it is to be kept hot until the coagulated mass is *completely* dissolved (which may take several hours or longer, and must be promoted by frequent shaking). When solution is complete, the upper layer is a clear oil sharply bounded by the aqueous layer. Now remove the flask, allow to cool, and fill with bisulphite solution, cautiously towards the end so as to drive the oil completely into the neck of the flask, and to bring the top of the aqueous layer exactly even with the lowest mark of the graduated scale. The oil thus swimming above constitutes the portion not consisting of aldehydes, which is deducted from the 10 C.c. of oil of cassia originally taken. The difference represents the amount of cinnamic aldehyde.

Supposing 2.7 C.c. of oily layer had been contained in the neck of the flask, then the 10 C.c. of oil of cassia would contain 7.3 C.c., or 73 per cent, of aldehyde. Properly speaking, the percentage is by volume, not weight; but as the specific gravity of the non-aldehydes in oil of cassia (1.060 at 20° C.) agrees so closely with that of the oil itself (1.059–1.061 at 20° C.), the above method of determination and statement is sufficiently exact.

In using this method some patience is requisite. It is absolutely necessary to wait until the magma has *completely* dissolved. Not the least trace of a solid lump must be discernible either in the liquid or adhering to the flask. If the bisulphite solution is not clear before use, it must be filtered.

If the magma refuses to dissolve after the flask has stood a whole day in hot water, a very large adulteration of the oil with some solid resin may be suspected. In this case a volumetric determination of the cinnamic aldehyde is impossible. In the case of an oil adulterated with resin and a mineral oil (the most common adulterants), the separated non-aldehyde retains its fluidity even though the resin amount to 30 per cent.

Instead of filling up the flask with more bisulphite solution, a strong solution of common salt (filtered) may be used. Plain water will not do, as the specific gravity of the aqueous layer would be too low to support the layer of oil.

In every case two determinations should be made and the mean value of the two taken. Usually the two determinations agree, or the differences should not exceed 4 per cent.

As already pointed out, the cinnamic acid present in any oil of cassia is determined by this method as part of cinnamic aldehyde. But since even an old commercial oil does not contain even 1 per cent of the acid, the error is insignificant.

In connection with the above, Schimmel & Co. mention a test of the purity of oil of cassia which was suggested by Hirschsohn. It is as follows:

Dissolve the oil in 3 parts of 70-per-cent alcohol. To 1 volume of the solution add, drop by drop, ½ volume of a solution, saturated at the ordinary indoor temperature, of acetate of lead in 70-per-cent alcohol. No precipitate should make its appearance. A precipitate would indicate the presence of resin.

Schimmel & Co. confirm the accuracy of this test. On adding the acetate of lead solution to the alcoholic solution of oil of cassia containing resin, the latter becomes cloudy at once, and a precipitate forms after a while. An oil unadulterated with resin, and also old oils containing a slight increase of cinnamic acid, remain clear. But the purposely exposed sample above mentioned, in which the cinnamic acid had increased to 8.5 per cent, did not stand the test, as might have been expected.

Since Hirschsohn's test requires but a small quantity of material, it is very serviceable, especially for the pharmacist.

Schimmel & Co. advertise consumers of the oil to reject any which does not contain at least 75 per cent of cinnamic aldehyde.

Oil of Cubebs has declined in price, in accordance with the price of the berries, of which a much larger quantity is now brought to market.

The cultivation of cubebs in Ceylon has not yet progressed beyond the experimental stage. Java will for a long while yet retain the monopoly in cubebs, although the shrub is also indigenous in Borneo, Sumatra, and New Guinea.

Oil of Eucalyptus.—Schimmel & Co. announce that they will shortly put on the market one or more new eucalyptus oils (from *E. maculata*, var. citriodora, and

others) which are distinguished by an agreeable mélisse-like odor, and promise to become very useful in perfumery and in soap manufacture.

The consumption of oil of eucalyptus (globulus) has not increased; one reason is that oil of cajuput has been found to be a profitable source for preparing eucalyptol (cineol).

Oil of Geranium.—Réunion and Mauritius have commenced to furnish this oil to the market. The Réunion oil is reported to be very fine. Its spec. grav. is 0.899; that of the Algerian oil is 0.891.

Oil of Gingergrass, also called Turkish oil of geranium, has become quite expensive, and is rarely obtainable in a pure state. Most of the oil which is distilled in the district of Nimar is adulterated, by the distillers themselves, with oil of turpentine which is sent to them from Bombay. The ordinary oil of gingergrass of the market is always adulterated with oil of turpentine.

Oil of Orris Root.—Florentine orris root has again been a failure this year, and what there is is of poor quality. Prices have advanced much and will go still higher. Schimmel & Co. hold out but little prospect of being able to supply the requisite amount of "oil of orris" under these circumstances.

Oil of Caraway.—The only safe criterion for the quality of this oil is the percentage of carvol. The new German Pharmacopœia recognizes as "Oleum Carvi" only carvol, which word is chosen as the German translation of "Oleum Carvi." The previous edition of the Pharmacopœia intended to do this likewise, but, owing to the absence of the word "carvol," the matter was left in doubt. The spec. grav. of carvol is given in the Germ. Pharm. as 0.96.

Oil of Lavender.—Some time ago a test for the presence of oil of turpentine in oil of lavender was proposed, which consisted in dissolving the latter in 3 parts of 70-per-cent alcohol at 16° C. It was claimed that a pure oil would dissolve perfectly, while an impure oil would not.

Schimmel & Co., however, show by proofs that this test is entirely unreliable. If the distillation of oil of lavender is pushed so as to drive over even the highest boiling fractions, the oil, though pure, will not dissolve to a clear liquid in 70-per-cent alcohol.

Oil of Almonds, expressed.—Schimmel & Co. point out that the two tests for the purity of this oil given by the new German Pharmacopœia are neither of them alone sufficient to decide this, but that *both together* must be complied with. The two tests are:

1. On briskly shaking a mixture of 1 C.c. of fuming nitric acid, 1 C.c. of water, and 2 C.c. of oil of almonds, a whitish, not red or brown, mass must be formed, which separates, after standing for some time at a temperature of about 10° C., into a firm, white mass and a scarcely colored liquid.

[This test will show the presence of peach-kernel and apricot-kernel oil, also sesame and cottonseed oil, which will produce a red or brown color.]

2. Mix 10 C.c. of oil of almonds with 15 C.c. of solution of soda and 10 C.c. of alcohol, stir well, and set aside at a temperature of 35°–40° C. until the mixture has become clear. Add 100 C.c. of water so as to produce a clear solution. On now adding an excess of hydrochloric acid a layer of oleic acid will separate which, after being separated, washed with warm water, and clarified on a water bath, should remain liquid at 15° C. One volume of this oleic acid should yield, with 1 volume of alcohol, a clear solution which should not separate any fatty acids at 15° C. nor be rendered cloudy on adding to it another volume of alcohol.

Schimmel & Co. state that this test is acceptable only if the requirement, that the separated oleic acid should remain liquid at 15° C., is to be understood in the sense "that it may become turbid, but should also remain liquid." Absolutely pure almond oil of their own manufacture showed that the oleic acid, under the above conditions, is sometimes turbid and non-transparent after it has been kept at 15° C. for some time. Of course the oleic acid layer must not become hard or mushy. This would indicate an adulteration with olive, peanut, cottonseed, poppy, walnut, or other oils. Apricot-kernel oil, however, would not be shown by this test, since the oleic acids derived from this retain their fluidity even at 10° C.

Oil of Peppermint.—Dr. Ed. Polenske has recently investigated the color reactions of this oil. He found, also, that an oil which had for some time been exposed to sunlight loses the faculty of yielding color reactions with acids.

The last Netherlands Pharmacopœia requires that a mixture of 5 drops of the oil with 20 drops of glacial acetic acid should gradually acquire a dark-blue, coppery-fluorescent tint.

Schimmel & Co. have found that the formation of the coloring matter depends upon a process of oxidation, and that no color is produced if air is excluded. If the mixture is exposed to light in a tightly corked vial, a bluish tint is scarcely noticeable and does not increase even on long standing. Admission of air, however, soon produces a dark color and a coppery fluorescence by reflected light. The reaction requires some time to develop, sometimes several hours.

Curiously enough, the Japanese oil of peppermint does not give this reaction, or but in a faint degree.

Oil of Rose.—Schimmel & Co. put on the market an oil of rose which is mechanically deprived of its stearopten. The large quantities of the latter which have accumulated at the factory induced the firm to investigate the nature of this stearopten, which, up to the present time, had been regarded as a homogeneous chemical individual. It was found that it could be divided into two bodies, one of which melts at 22° C., while the other melts at about 40° C. At first it was supposed that this was due to an adulteration, since all this stearopten was obtained from Bulgarian oil of rose. But Schimmel & Co. obtained the same results with stearopten separated from oil of rose distilled by themselves. It is therefore proven that the stearopten of oil of rose is a complex body; probably it consists of a whole series of homologous hydrocarbons.

Oil of Star Anise.—The districts in which star anise grows, in the province Lang-sou, are now probably entirely under French dominion. At all events, the trade in star anise and its oil will, from January 1st, 1890, be a monopoly in the hands of a French house at Hanoi. It remains to be seen what the price will be under the new conditions.

Oil of Wintergreen.—An artificial oil of wintergreen, manufactured in Hamburg, has recently appeared in the New York market. This oil contains some methyl benzoate ("oil of Niobe"), which can be recognized by the odor alone. Its specific gravity is only 1.133, while the pure methyl salicylate has one of 1.180. Pure methyl benzoate has the spec. grav. 1.095. The new Hamburg product, therefore, probably consists of equal parts of methyl benzoate and salicylate.

Oil of Ylang.—Ylang is now also cultivated with success in Réunion. The first oil distilled there has turned out very satisfactory. It was found to have a much higher spec. grav. (0.974) than the best oil distilled in the Philippine Islands (0.947).

Oil of Sassafras.—Schimmel & Co. warn against a spurious or impure safrol which has lately been put on the New York market. It has not been sufficiently purified from other constituents of oil of camphor from which it is extracted, and has even a lower spec. grav.—viz., 1.048—than the poorest commercial oil of camphor itself, while pure safrol has the spec. grav. 1.180.

The Number of Retail Liquor Dealers in the United States, according to the official returns of the officers of the internal revenue for the year ending May 1st, 1890, was 185,868, or 1 liquor dealer to every 275 inhabitants, on the basis of the census of 1880. In New York there was 1 retail dealer in distilled liquors to every 150 inhabitants; in New Jersey, 1 to 175; in Ohio, 1 to 230; in Pennsylvania and Massachusetts, 1 to 400; in Indiana, 1 to 325; in Delaware, 1 to 160; and in California, 1 to 75. The average in all the States which have general license laws is 1 dram shop to 250 inhabitants. In Maine there is 1 retail dealer in distilled liquors to every 750 inhabitants; in Vermont, 1 to 820; in Iowa, 1 to 520; and in Kansas, 1 to 800.

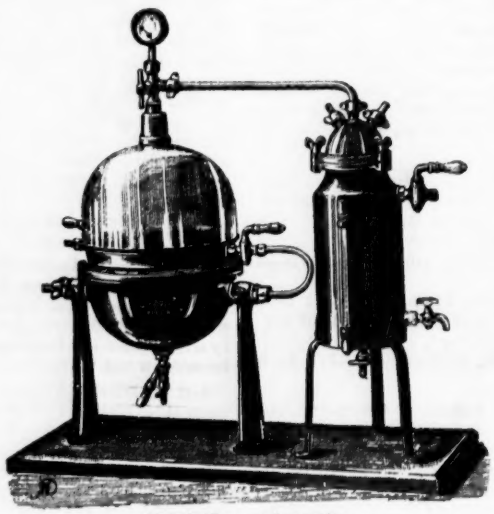
VACUUM APPARATUS.

We have had inquiries directed to us recently regarding the best form and the place of manufacture of small vacuum apparatus suitable for making solid extracts, or concentrating liquids containing odorous principles. We have given to our correspondents several addresses of manufacturers, but we are informed that the latter do not make such apparatus except upon order, and that the form and style of the large vacuum pans made for sugar houses, condensed-milk works, etc., is too cumbrous and complicated when reduced to the small scale demanded by our correspondents. Offers were made to design and construct vacuum apparatus of a simpler construction, but no guarantee was given that it would work well. As an alternative it was proposed that the party requiring the apparatus should furnish a design with specification, whereupon it would be executed in the most substantial style.

This latter proposition appears to us a fair one, and we have advised its acceptance. But our correspondents preferred to look about elsewhere, in order to see whether a ready-made apparatus could not be obtained. We then drew their attention to one which was described some time ago in the *Pharmaceutische Centralhalle* (1890, 148), which was devised by Eugene Dieterich. As this may be of use to others of our readers, we give an illustration and description here.

This apparatus consists, first, of a vacuum pan which can be heated either with steam or hot water, and which is covered by a glass bell; and, second, of a condenser. The aspiration of the vapors generated in the liquid in the vacuum pan by heat is effected by means of a so-called injector, or water jet, inside of the condenser. Of course it is necessary, for its successful working, to have at hand a suitable supply of water under pressure. The vapors are not only aspirated or drawn over, but they are at the same time condensed, so that if they consist, for instance, of alcohol, the latter may be recovered.

Experience has shown that the mode of exhaustion by means of a water jet is sufficient for an apparatus of the capacity of about 5 quarts. When it is materially larger, an air pump becomes necessary.



Christ's Vacuum Apparatus.

The apparatus here described is made by Gustav Christ, Blumenstrasse 74, Berlin.

The Detection of Iodine.

The reaction of potassium iodide with the platinic salts, mentioned in Watt's "Dictionary of Chemistry," vol. iii., p. 288, furnishes a valuable test for the soluble iodides, being characteristic and delicate. The manner of making the test is as follows:

To the solution in a test tube add one or two drops of solution of platinic chloride. As the platinic chloride mixes with the liquid a beautiful red coloration is produced, due to formation of platinic iodide. If much iodide be present, the solution becomes black, with subsidence of a brownish precipitate.

Free potassa, ammonia, and hydrochloric acid require the addition of a large amount of the platinic chloride. It is therefore best to have it neutral, or acid with sulphuric acid. The reaction is plainly visible if $\frac{1}{150000}$ part of iodine be present, and is readily seen, though faint, with $\frac{1}{1000000}$ part of iodine. The test has been subjected to a large number of trials to prove its value, with most satisfactory results.—W. H. Seamon in *Chem. News*, November 21st.

On Strychnine and Some of its Salts.

Some doubt having recently again been thrown upon the correctness of the now recognized formula of **strychnine**—which is that established by Regnault, viz., $C_{21}H_{22}N_2O_2$—C. Stoehr has made a careful re-examination of the subject and finds that the above formula is undoubtedly correct.

In the course of his paper (in *Journ. f. prakt. Chem.*, 42, 399), the author gives some data regarding some salts of strychnine which deserve recording:

Hydrochlorate of Strychnine. The formula $C_{21}H_{22}N_2O_2.HCl.1\frac{1}{2}H_2O$ is confirmed.

Hydrobromate of Strychnine has the composition $C_{21}H_{22}N_2O_2.HBr.H_2O$.

Hydriodate of Strychnine has the same composition as the last named, except that iodine is in place of bromine.

All three salts may be deprived of their water of crystallization by drying over sulphuric acid. On exposure to air they rapidly reabsorb it.

Regarding the melting point of strychnine, the author found it to be 265°–266° in a sample received from Merck. When the crystals were purified by recrystallization, the melting point rose somewhat. At 260° the powder became darker, and at 269° it melted to a dark brownish yellow liquid without evolving gas. The true melting point is probably between 268° and 269°C.

Zinc Sulphite as an Antiseptic.

Twenty years ago, in a paper read before the British Pharmaceutical Conference at Liverpool, Professor Tichborne called attention to the possible value of **zinc sulphite** as an antiseptic. Recently he has again suggested it as a material for the preparation of antiseptic dressings, and Dr. Heuston reports that for this purpose he has found it superior to sal-alembroth [mercuric chloride with ammonium chloride], it being non-poisonous, non-irritative, and highly antiseptic (*Brit. Med. Journ.*, November 8th, p. 1064). Professor Tichborne states that zinc sulphite is best prepared by mixing in solution six parts of zinc sulphite and five and a quarter parts of sodium sulphite. The reaction takes place slowly, but goes on to completion; the new salt, which forms as a white crystalline precipitate, being very insoluble in water, though soluble in excess of sulphurous acid. Dried at 100° C. it has a composition represented by the formula $ZnSO_3.2H_2O$, but if only dried at the ordinary temperature it contains another molecule of water. In contact with water it undergoes a slow but regular oxidation, which, in an experiment with a saturated solution, was complete on the eighteenth day. Zinc sulphite can be used for the saturation of any fabric, such as gauze or lint, without the intervention of an adhesive material. The fabric is first boiled with water to cleanse and sterilize it, after which a boiling solution of zinc sulphate and sodium sulphite in equivalent proportions is poured upon it, and when thoroughly mixed and saturated the whole is allowed to stand for twelve hours. The zinc sulphite is said to be deposited in and about the fibres of the fabric in microscopic crystals, soft and even unctuous to the touch. The fabric is then passed under rollers submerged in water, to remove traces of sodium sulphate. It is suggested that this kind of dressing might be dyed with an organic pigment to distinguish it from others, and for the purpose of indicating the progress of the discharges by the action of liberated sulphurous acid on the color.—*Pharm. Journ.*

AN AUTOMATIC STIRRER.

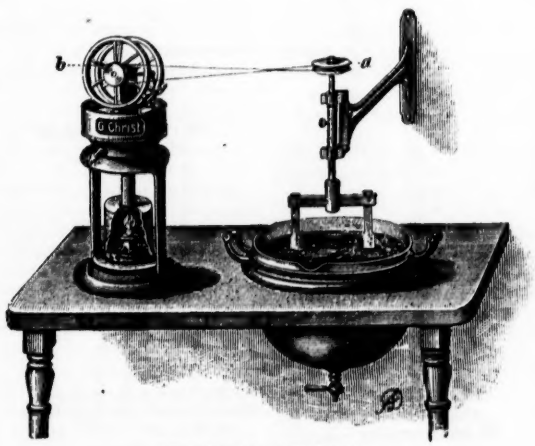
In connection with the vacuum apparatus described on page 22, the *Pharmaceutische Centralhalle* (1890, 150) figures a new and improved stirring apparatus very useful in concentrating extracts. It is also made by Gustav Christ, of Berlin.

The two-armed stirrer is held by a bracket fastened to the wall. The stirrer is operated by a small hot-air motor which works on the principle of Ericsson's caloric engine. For moving the latter, either a gas flame or a lamp may be used.

[Of course, if the liquid to be evaporated gives out inflammable vapors, proper care must be taken to prevent the vapors taking fire from the flame.—Ed. Am. Drugg.]

Improved Manufacture of Potassium Cyanide.

This method for the production of potassium cyanide—which depends, in the first place, upon the formation of potassium sulphocyanate, and the conversion of that substance into potassium cyanate, and, lastly, that of potassium cyanide—is brought about as follows: A proportionate quantity of carbon disulphide is blended with an equal bulk of mineral oil, to which is added a convenient quantity of water. Ammonia gas is now introduced until the whole of the CS_2 is converted into ammonium sulphocarbonate. The concentrated solution thus formed is separated from the remaining oil and a fresh quantity of CS_2 added, the action proceeding as before. The solution containing the ammonium sulphocarbonate is now allowed to boil until all traces of ammonium sulphide have been expelled, the ammonium sulphocarbonate becoming converted into ammonium sulphocyanate.



Christ's Automatic Stirrer.

To the solution, while still hot, is introduced a sufficiency of KHO, and the heat maintained while any NH_3 gas continues to be evolved, the gas thus expelled being utilized for the production of a further quantity of ammonium sulphocarbonate. The resulting solution of KCNS thus formed is evaporated to dryness and introduced into a deep crucible, being subjected to a dull red heat in contact with litharge; the KCNS thus being converted into potassium cyanate, with the production of PbS. The crucible, with its contents, is then allowed to settle, and the melt removed by decanting into a further pot furnished with a perforated lid and containing lump carbon; the heat is now raised and continued at full redness as long as any traces of CO_2 or CO continue to escape. The resulting KCN thus obtained is poured from the pot and received into suitable moulds.—H. N. Warren in *Chem. News*, November 21st.

Fatal Poisoning with Salol.—Dr. Hesselbach has reported the case of a young man, suffering with rheumatism, who took by mistake 2 drachms of salol. Coma resulted, with great dryness of the tongue, anuria, and death on the second day. At the necropsy the kidneys were found to be soft, anæmic, and of a pale yellow color; microscopically, the glomeruli were full of embryonic cells and leucocytes, the convoluted tubes were tumefied, and fatty degeneration had begun. The tubuli were filled with degenerated epithelium. There were no other lesions attributable to the drug. The toxic principle was the carbolic acid that is generated from salol in the system. The author believes that salol should be prescribed with caution, and the condition of the kidneys, as indicated by the urine, watched.

Separation of Antifebrin and Phenacetin.

In view of the possibility of the difference in cost leading to a sophistication of phenacetin with antifebrin, a number of tests for the presence of acetanilide have been published, a digest of which has already been given in "The Month" (*Pharm. Journ.* [3], xviii., 1085). To these may now be added a method of determining within certain limits the proportions of acetanilide and phenacetin in a mixture based upon their differing solubilities, which was worked out by Dr. Will for the purposes of the investigation referred to in the preceding paragraph (*Apot.-Zeit.*, October 22d, p. 652). It was found that 1 Gm. of acetanilide shaken for half an hour with 200 C.c. of cold water dissolved completely, and did not separate after standing for a day at the ordinary temperature.

On the other hand, when 0.5 Gm. of phenacetin was shaken for the same time with 200 C.c. of water, only 0.13 Gm. was dissolved. Upon shaking 1 Gm. of a mixture of equal parts of acetanilide and phenacetin with 200 C.c. of water, the whole of the acetanilide went into solution, with only 0.13 Gm. of phenacetin; the residual phenacetin, when separated and washed with water, being quite free from acetanilide.

In two other experiments, in which the proportions of the two compounds were slightly varied, it was found that the weight of the undissolved phenacetin, added to 0.13 Gm. as the quantity dissolved in 200 C.c. of water, corresponded to the quantity present in the mixture used. —*Pharm. Journ.*

Coca Leaves.

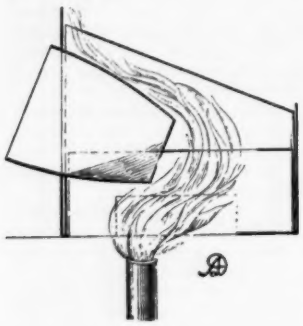
The trade in coca leaves has lost much of its importance since the crude cocaine commenced to be manufactured in Peru and exported hence to Europe, and principally to Germany, where the cocaine manufacturers find it to their advantage to use it in preference to the leaves. From South America the leaves are imported in bales weighing from 1¼ to 4 cwt. There is no regular season of import, as there are two or three harvests of coca leaves in South America every year, and the produce—or what is shipped of it—is mostly sent to Hamburg or New York, which are the principal markets for coca. In 1881 the imports into Hamburg were only 23 bales of this drug, which was then slowly working its way into favor. In 1886, after the discovery of the medicinal virtues of cocaine, the imports reached 1,720 cwt., but since then they have again declined considerably. New York exported about 1,800 cwt. Coca leaves have occasionally been imported from British India, and during the last two or three years some progress is apparent in the exports from Ceylon and Java.

The Ceylon leaves are often of excellent quality, well cured and preserved, and characterized by the fine bright green color and tea-like odor which distinguish the best quality of leaves. They are sometimes put up in small tin-lined boxes, which is without doubt the most suitable mode of packing. The Java coca leaves which have been received thus far are usually badly dried, and very small and brown. They are occasionally crushed before shipment. The weight of a package of Ceylon or Java leaves is usually about 40 lbs.—*Chem. and Drugg. Diary.*

Oxide of Lead in a Loaf of Bread.—The oxide of lead found in the bread of the Chicago baker has been traced to the stencilling of the name of the miller on the bag containing the flour from which the bread was made, the color having been put on so heavily that it soaked through the cloth.

IMPROVED METHOD OF INCINERATION.

H. VON JUEPTNER recommends the use of a sort of hood made of asbestos for compelling the flame to play around and over a crucible during the process of incineration. The shape of the flue or hood and the position of the crucible will be easily intelligible from the accompanying illustration. The hood, of course, must be supported by a suitable frame.—*Chem. Ind.* and *Z. anal. Chem.*, 1890, 433.



Gum Arabic.

THE true Kordofan gum has for several years been practically falling on our [English] markets. It used to reach us (and a few old packages still do so occasionally) in large bales or serons, weighing from 300 to 500 lbs., and containing "sorts"—*i.e.*, unsorted gum as received in Cairo or Alexandria from the traders who bring it down the Nile; or it came *via* Trieste, the great sorting market, in cases of about 300 to 400 lbs., containing the "first" and "second picked" or superior varieties, or in bags containing the lower grades.

Turkey gum arabic, being hygroscopic, has, with a few other drugs, the property of gaining weight by being kept in the warehouse—a property which is by no means unknown or despised by the wholesale dealers.

The leading variety of gum arabic at the present time, so far as pharmaceutical gums are concerned, is undoubtedly the Senegal gum, of which the commercial headquarters in Europe are at Bordeaux, the drug being collected in the French Senegal territory. Senegal gum is divided into "Bas-de-Fleure" (*i.e.*, "Lower River") and "Galam." All gum now used in pharmacy, it is safe to say, contains a very large percentage, if it does not exist entirely, of Senegal gum which has been picked and sorted in France or in Trieste. A useful kind of pale gum is imported from Mequinez, Mogadore, and other ports in Morocco. It occurs in bold round or oblong tears, friable, of a soft, dull appearance, and varying in color from cream to dark orange-red.

This variety is known as "white Mogadore" or "white Barbary"; while a gum which occurs in small, glassy, dull-brown pieces, and is imported from the same quarter, is known as "brown Barbary" gum. This gum is much less valuable than the white gum.

Mogadore gums are brought over in casks of about 1½ cwt.

From South Africa two varieties of gum are imported—one the hard brown Cape, which is obtained from *Acacia horrida*. This has been known for many years, and is described in "Pharmacographia"; but during the last six or seven years another variety has been regularly consigned to the London markets. This is "soft white Cape," which is gathered in the northern parts of Cape Colony beyond the Orange River. Fine picked white Cape is as fine in appearance as any Kordofan gum, and is exceedingly like the old Turkey gums. London is the principal market for East Indian gums, the use of which has greatly increased since the scarcity of Kordofan gums commenced.

East Indian gums come over in cases, bags, or bales, varying in weight from 2 to 6 cwt.

The total exports of British Indian gums and resins during the last five seasons have been, in cwts.:

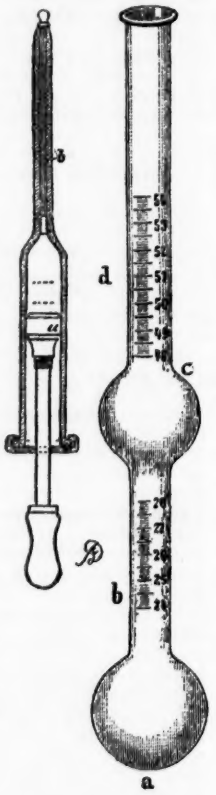
1884-5	1885-6	1886-7	1887-8	1888-9
19,814	55,407	24,401	37,132	62,645

—*Chem. and Drugg. Diary.*

NEW BUTYROMETERS.

NILS G. K. HUSBERG, of Arboga, Sweden, has patented a butyrometer which is here illustrated (Fig. 1). It is in form of a syringe. A definite quantity of milk, at normal temperature, is first introduced, the amount being determined by graduation on the cylinder, next certain chemicals (acid of a definite strength, etc.) described by the patent, and finally the piston is inserted. Separation of the butter is promoted by brisk shaking. When the butter has all been separated it is pushed, by means of the piston, into the narrow nozzle of the syringe, where its height is read off. If proper care is used and uniform temperature maintained, the apparatus is said to give fairly good results (Germ. Pat. 50,988). Of course its readings would not be reliable enough to condemn any one for adulteration. But this is not the object. The principal object is to place in the hands of the common people an instrument which will approximately show whether some particular sample of milk is normal or requires further examination by actual analysis.

FIG. 1. FIG. 2.



Another butyrometer is that shown in Fig. 2. It has been devised by Bodzynski, the process for determining the fat being that proposed by W. Schmid in *Zeitsch. f. anal. Chem.*, 1888, 464.

Ten Gm. of milk are introduced into the bulb *a*, next 10 C.c. of concentrated hydrochloric acid are added, and the mixture heated over a flame. It will boil quietly without foaming. When the albuminoids which have at first separated are completely redissolved, the solution is cooled off, under a stream of water, to about 40° C. (104° F.). 30 C.c. of ether are then added, the whole well shaken, and then set aside, either at the ordinary indoor temperature, or, better, in a water bath at 40° C., during 15 or 20 minutes. [Ordinary hydrous ether must be used. If stronger ether is employed, too much will be lost at the prescribed temperature.—ED. AM. DRUGG.] The column of liquid representing the milk and acid will now reach up beyond the mark 24 on the graduated scale, while the ethereal solution is above it. When the foamy zone between the two layers has disappeared, the volume of ethereal solution is read off. A definite portion of this is now evaporated in a tared capsule, and from the weight of the butter thus found the total amount of that contained in the sample of milk is easily calculated.—After *Dingl. Polyt. Journ.*

Florida Water.

Oil of Lavender	2 drachms.
Oil of Bergamot	2 "
Oil of Lemon	2 "
Oil of Neroli	1 "
Oil of Melissa	30 minims.
Otto of Rose	10 "
Tincture of Turmeric	1 drachm.
Spirituous Menstruum	32 fl. oz.

Mix. —*Chem. and Drugg. Diary.*

[The spirituous menstruum intended is so-called cologne spirit, of which about 30 fl. oz. are taken at first for dissolving the oils. Then a little distilled water is added, sufficient to produce a faintly opalescent mixture after shaking, and the liquid then cleared up again by adding enough alcohol to make 32 fl. oz.—ED. AM. DRUGG.]

On the Constituents of the Artificial Salicylic Acid of Commerce.

PROF. W. R. DUNSTAN and MR. O. F. C. BLOCH have made a study of the artificial salicylic acid at present sold in commerce, with a view of determining the nature of any accompanying impurities. This investigation was chiefly undertaken to ascertain the reason why untoward results had recently been observed and reported, after the administration of the acid, by several authorities.

The presence of certain impurities commonly existing in the acid was first pointed out in 1878 by John Williams, but the nature of the impurity was not made out. In 1888 Ewell and Prescott ascertained that the contaminating substances were probably acids derived from the cresols and xylenols contained in the crude phenol from which the salicylic acid was made. Bernhard Fischer examined the subject in 1889 and found similar results (for details we must refer to the original paper of the authors in *Pharm. Journ.*, November 22d). One of the authors had examined in 1884 an acid which Mr. Williams had separated from artificial salicylic acid. This was found to be a variety of hydroxytoluic or cresotic acid, viz., beta-cresotic acid, or, as the authors propose to call it, ortho-cresotic acid. A specimen of this acid was sent to Dr. Charteris (who is one of the authorities through whom the bad quality of artificial salicylic acid has lately again been drawn attention to). This physician found it to be possessed of strongly toxic properties.

Another contaminating acid, likewise extracted by Williams, was examined by the authors, and found to be the so-called homosalicylic or gamma-cresotic acid; they propose, however, to call it meta-cresotic acid.

These two acids are derived from ortho- and meta-cresol, existing in the phenol from which the salicylic acid is prepared.

Melting Point of Salicylic Acid.—As is the case with most organic compounds, salicylic acid has been stated to melt at various temperatures. These temperatures range between 155° and 159° C. The principal chemical treatises accept as most correct the determinations of Hübner (*Annalen*, 162, 74) and Kobler (*Ber.*, xii., 246), who stated the melting point to be between 155° and 156°. The best of those commercial specimens which occur in small crystals melt near these temperatures. The British Pharmacopœia states that salicylic acid should melt at "about 155° C.," whether it has been prepared from oil of wintergreen or from phenol. B. Fischer has pointed out that the pure acid melts at 156.8° C., but he did not sufficiently investigate the question to satisfactorily establish this as the correct melting point. As it was of considerable importance, in connection with the inquiry which the authors were making, to know for certain at what temperature pure salicylic acid melts, the following experiments were made: The melting point of some fine crystals of salicylic acid obtained from oil of wintergreen was 156.75°. The crystals were dissolved in alcohol, and the solution partly precipitated with water, when a mass of woolly crystals was obtained; these also melted at 156.75°. The acid was in the next place converted into its sodium salt, and the solution partly precipitated with silver nitrate. The precipitate was well washed, the acid recovered from it and crystallized from alcohol. The crystals melted at 156.75° C. The acid was also recovered from the salt which remained dissolved in the filtrate from the silver precipitate, and was crystallized from alcohol. This also melted at 156.75°. Further evidence that the acid melting at this temperature was pure salicylic acid was gained from an analysis of its silver and lead salts.

The authors now proceed to detail the methods by which they attempted to isolate the impurities in the commercial salt. They first converted the acid into the calcium salt, and sought to separate this into various fractions sharply distinguished by having different melting points. While this was but partially successful, they nevertheless discovered in the last fraction obtained a new acid, melting at 151° C., which was ascertained to be another variety of hydroxytoluic acid, heretofore known as alpha-cresotic acid, but which the authors propose to call para-cresotic acid, as it is derived from para-cresol.

Omitting further details regarding unsuccessful attempts to purify the commercial acid, we at once pass to that portion of the paper in which the authors give an account of the method finally hit upon as best suited for the purpose. It should be premised that on converting the acid into the lead salt, they saw their way clear towards the desired end. But at first they used acetate of lead for precipitation, which became inconvenient on account of the acetic acid which was set free. Finally they hit upon the plan of using lead carbonate.

Five Gm. of the same commercial specimen of salicylic acid, which had been successfully purified by means of lead acetate, were boiled with 300 C.c. of water and an equal weight of precipitated lead carbonate, until all chemical action had ceased. The turbid liquid was filtered while hot, when some of the basic lead salt, together with a little unaltered lead carbonate, was removed.

The filtrate crystallized as it cooled, yielding a large first fraction of lead salt, and by repeated evaporations of the filtrate three other fractions were obtained. Each fraction was well washed with cold water, and the acid recovered and crystallized from alcohol. The following numbers are the melting points of the acid obtained from the various fractions of lead salt:

Fraction I.

1st Crystals from Alcohol	m. p. 155.75°
2d " " "	m. p. 155.6°
Fraction II.	m. p. 154.°
Fraction III.	m. p. 152.75°
Fraction IV.	m. p. 152.6°

The plan had, therefore, proved no more successful than that in which the calcium salts had been similarly employed, the separation not being at all sharp. The next experiments were made with alcohol instead of water, but it was observed that the reaction between lead carbonate and salicylic acid is very sluggish in the presence of little water. It was, therefore, decided to form the lead salts with water as before, and then to add alcohol before crystallization commenced.

One hundred Gm. of salicylic acid were mixed with 97 Gm. of lead carbonate and 700 C.c. of water. The mixture was heated in a water bath for about half an hour, during which time it was constantly stirred. All action being over, 800 C.c. of alcohol (methylated spirit) were added. The liquid was then boiled and filtered from the basic salt which had separated. The filtrate crystallized as it cooled, and afforded a first fraction. This was filtered off and the liquid concentrated by distillation, when a second fraction was obtained, and by further concentration a third and fourth fraction. The melting points of the different specimens of acid were as follows:

Acid from Basic Salt.

1st Crystals from Alcohol	m. p. 156.75°
2d " " "	m. p. 156.°
3d " " "	m. p. 155.5°

Fraction I.

1st Crystals from Alcohol	m. p. 156.75°
2d " " "	m. p. 156.75°

Fraction II.

1st Crystals from Alcohol	m. p. 156.75°
2d " " "	m. p. 156.75°
Fraction III.	m. p. 154.1°
Fraction IV.	m. p. 151.3°

The separation in this case was perfectly satisfactory. Seventy-six per cent of the original substance had been recovered as pure salicylic acid in a single operation, the first two fractions of lead salt having yielded the pure acid.

The fourth fraction, representing about 6 per cent of the original substance, had yielded nearly pure para-cresotic acid. The fact that the second fraction, as well as the first, afforded pure salicylic acid, shows that somewhat less alcohol might have been added to the original liquid, when the first fraction would have been larger. In actual practice the first fraction may safely represent rather more than 75 per cent of the substance taken: but when much impurity is present, it is better to recrystallize this large fraction from dilute alcohol (25 vols. meth. spirit, 75 vols. water) instead of washing it on the filter, in order to completely remove the adhering mother liquid.

It is noteworthy that a considerable quantity of the basic salt is produced in this process.

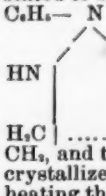
This may, however, be avoided by adding to the hot aqueous liquid, as soon as the action between the lead carbonate and salicylic acid is over, from 3 to 4 Gm. of strong acetic acid for each 100 Gm. of salicylic acid employed, and then continuing the heating for a short time. By this means, only a very small quantity of the basic lead salt is left insoluble. For the same reason, if it is necessary to recrystallize the first fraction of lead salt from dilute alcohol, acetic acid should be added to the liquid. By working in this manner, in a single operation 80 per cent of pure salicylic acid was obtained from an impure specimen melting at 153.75°.

The authors suggest that a "purified" salicylic acid should be demanded by the Pharmacopœia. This acid should be required to be in separate, well-defined, prismatic crystals, melting between 156.5° C. and 157° C., and from this purified acid the salicylates should be prepared. —After *Pharm. Journ.*, November 22d.

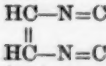
[*Note by Ed. Amer. Drugg.*—The authors acknowledge in a foot-note that the acid may appear in form of separate crystals and yet contain 2 per cent of para-cresotic acid. They want the requirement of "separate crystals" to be always fortified by the melting point, which should be as given above. It should, however, be remembered that the taking of melting points with any degree of accuracy, particularly where a few degrees more or less will make a great difference in the conclusions to be derived therefrom, is an operation requiring skill, experience, and accurate thermometers. Hence the verification of the melting points will not likely be a practicable requirement for the average pharmacist.]

Dehydro-methyl-phenyl-pyrazine.

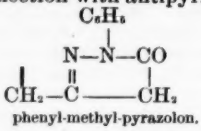
DEHYDROMETHYLPHENYLPYRAZINE is the systematic name attributed to the latest claimant for a place among the now numerous band of antipyretics, though the description given of its preparation leaves considerable doubt as to the correctness of this designation (*Pharm. Cent.*, November 6th, p. 663). The first stage in its preparation is stated to be the formation of phenylpyrazine by heating upon a water bath equivalent quantities of beta-bromo-, chloro-, or iodo-propionic acid and phenylhydrazine, dissolved in water, alcohol, or benzol, until free phenylhydrazine can no longer be detected, and separating by shaking with water. **Phenylpyrazine**, $C_{10}H_{10}N_2O$, is described as difficultly soluble in cold water and in benzol, somewhat more soluble in hot water, freely soluble in alcohol and chloroform, and as melting at 121° C. It is stated to be represented by the formula:



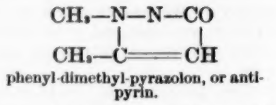
This compound is submitted to an oxidation process by agitating 20 parts dissolved in 500 parts of chloroform with 32 to 35 parts of dry mercuric oxide, which is said to result in the removal of two atoms of hydrogen from the fatty acid residue, CH_2—CH_2, and the formation of dehydrophenylpyrazine, which crystallizes out in flat needles melting at 154° C. Upon heating this product with methyl iodine and wood spirit to 100°, the so-called dehydromethylphenylpyrazine is obtained. It is described as possessing powerful basic properties, and occurring, when crystallized from chloroform, in large crystals, melting at 120° C., and readily soluble in water. With respect, however, to the statement quoted as to the formation of phenylpyrazine, it may be remarked that the general structural formula for the pyrazines is:



This differs from the formula given in being a six-membered ring, having the two atoms of N in the para position to one another, and containing no CO group. In a phenylpyrazine an atom of hydrogen in one of the CH groups would be replaced by C_6H_5. In fact, the alleged formula of phenylpyrazine is that of a phenyldihydropyrazolon, which is a compound that might be expected to be formed by the condensation of phenylhydrazine with iodo-propionic acid. The subsequent elimination of two atoms of hydrogen and the substitution of another by a methyl group would result in the formation of phenylmethylpyrazolon, a compound closely allied to antipyrin, which is **phenyl-dimethyl-pyrazolon**. A compound having the constitution of (1) phenyl- (3) methyl- (5) pyrazolon has been described by Knorr (*Annalen*, ccxxxviii., 147), who represents it by a formula that shows its close connection with antipyrin:



phenyl-methyl-pyrazolon.



phenyl-dimethyl-pyrazolon, or antipyrin.

—After *Pharm. Journal.*

Methylal as a Solvent.

VARIOUS volatile compounds have been recommended at different times as solvents for the extraction of the odorous principles of flowers, but none of these have displaced fats and hydrocarbons as used in the processes of maceration and enfleurage. The principal obstacles to their use have been the relatively high boiling point, which has not allowed of the recovery of the odorous principle unaltered, and the pertinacity with which minute quantities of the solvent adhere to the extracted substance. It is now stated that **methylal** affords a solvent free from these disadvantages, it having a relatively low boiling point (42° C.) and volatilizing readily and to the last trace (*Chem. Zeit.*, October 29th, p. 1474).

Practical experiments upon violet flowers are reported to have resulted satisfactorily, and it is expected that methylal will come into use for the purpose on an industrial scale.—*Pharm. Journ.*

[*Note by Ed. Am. Drugg.*—Methylal is a very volatile aromatic liquid, having the spec. grav. 0.860 at 20° C., boiling at 42° C. (107.6° F.), and soluble in 3 parts of water. It is prepared most economically by distilling a mixture of 2 parts of manganese dioxide and 2 parts of refined methylic alcohol with a mixture of 3 parts each of strong sulphuric acid and water.]

Composition of Soap-Stone.

AS powdered talcum is often used by pharmacists as a medium for obtaining clear filtrates, it is well to know its composition. Properly speaking, it is a silicate of magnesium, but it generally contains iron and other impurities. F. W. Clarke and E. A. Schneider have recently examined some talcum with the following results. The sample of talc with which the experiments were carried out came from Hunter's Mill, Virginia, and when dried in air gave the following analysis:

	Per cent.
Silica	62.27
Alumina	0.15
Ferric Oxide	0.95
Magnesia	30.95
Ferrous Oxide	0.85
Manganous Oxide	Trace
Water (loss at 105°)	0.07
Loss on ignition	4.84
	100.08

These figures agree closely with the empirical formula $H_2Mg_3Si_4O_{12}$.

Talc is usually held to be an acid metasilicate, $H_2Mg_3(SiO_3)_4$. Groth, however, prefers to consider it as a basic pyrosilicate, $Mg(Si_2O_5)_2(MgOH)_2$, derived from the acid $H_2Si_2O_5$. Olivine behaves like talc to hydrochloric acid gas, being only superficially attacked; but talc is the only one of these minerals that withstands the action of aqueous hydrochloric acid. This power of talc for resisting the action of hydrochloric acid is a strong argument against considering it to be a basic pyrosilicate.—After *Berichte* and *Journ. Soc. Chem. Ind.*

[In commercial parlance the name *talc* is commonly used for mica.—ED.]

The Best Way to Cover the somewhat strong and disagreeable odor of naphtalin is to sublime it together with a little gum benzoin or benzoic acid. The desired effect is produced by simply mixing the two substances together.

NOTES ON NOVELTIES.

Picrate of Veratrine.

Veratrine forms only a few crystalline salts, according to Felix B. Ahrens (*Berichte*, 1890, 2700). One is the double chloride of gold and veratrine, $C_{32}H_{49}NO_9.HCl.AuCl_3$; another is the corresponding mercury salt, and the third is the picrate, $C_{32}H_{49}NO_9.C_6H_3(NO_2)_3OH$. The last named is prepared by adding aqueous solution of picric acid to an alcoholic solution of hydrochlorate of veratrine (which latter salt does *not* crystallize). The picrate then separates gradually in crystals which are very permanent, insoluble in water, but easily soluble in alcohol.

Larixolin.

A GERMAN patent has been issued for a compound named **larixolin**, which is alleged to be a perfect imitation of French oil of turpentine (*Pharm. Centr.*, Nov. 6th, p. 669). It is described as consisting of a mixture in definite proportions of petroleum and camphor oil, and is alleged to not only have nearly exactly the same odor as oil of terpentine, but to be a mixture of hydrocarbons of the turpene series almost identical with the terebinthine of French oil of turpentine. Its specific gravity at 15° C. is given at 0.8535 as compared with 0.8660, and its igniting point at 55° C. as compared with 45 C. for French oil of turpentine. Larixolin is said to be applicable for all the purposes for which turpentine oil is used.—*Pharm. Journ.*

Iodo-Carvacrol.

WHEN **carvacrol** is subjected to the same treatment as its isomer thymol is in the preparation of **aristol** (*Pharm. Journ.* [3], xx., 601), an iodine substitution product is obtained resembling in its general characters the iodine derivatives of phenols, and said to be likely to find a place in the materia medica (*Chem. Zeit.*, October 4th, p. 1355).

A dilute solution of 1.5 parts of carvacrol in 1.6 parts of soda is heated with 10.16 parts of iodine and 10.16 parts of potassium iodide, and made alkaline, when a yellow precipitate forms that is separated and washed with water. The new compound is described as occurring in the form of a yellow-brown powder which is insoluble in water, difficultly soluble in alcohol, and easily soluble in ether, chlorotorm, and olive oil. It is unaltered by light, and when heated in a capillary tube softens at 50° C., and melts at about 90° C. to a brown liquid.—*Pharm. Journ.*

Citral.

THIS name was proposed in 1888 by Schimmel & Co. to denote the principal odorous constituent of oil of lemon. Since that time the above firm have perfected the method of isolating it, and have now put the article on the market.

Citral boils at a reduced pressure of 16 Mm. at 116° C.; at the ordinary pressure it boils at 228°–229° C., and, if it is pure, does not decompose at this temperature. It is an aldehyde, forming solid compounds with bisulphites. It probably has the formula $C_{10}H_{16}O$.

Oil of lemon contains on an average 7½ per cent of citral. Hence 75 Gm. of it are equivalent to 1 kilo of the oil. Yet it must be acknowledged that citral lacks somewhat of the "freshness" of the aroma which good oil of lemon possesses. On the other hand, it is so very much more soluble in dilute alcoholic liquids that its use will certainly become general. In order to combine both the ready solubility of the citral and the fresh aroma of the oil, it is proposed to mix 75 Gm. of citral with 1 kilo of the oil, and to regard this equivalent to 2 kilos of oil, of which a proportionate quantity is then taken. According to Schimmel & Co., 15 Gm. of this mixture are sufficient to prepare 100 liters (about 26½ gallons) of a lemon spirit of fine aroma, and perfectly clear even if it contains but little alcohol.—SCHIMMEL & CO.'s October *Berichte.*

Iodoform Substitute.

AT the last meeting of the Society of Therapeutics, Pharmacist Yvon said, after numerous trials for devising an iodoform substitute, odorless and easily prepared, he fixes upon cinchonine iodosulphate, a combination obtained when the alkaloid sulphate is thrown down with Bouchardat's reagent—that is, iodized potassium iodide. Cinchonine was selected owing to its comparatively low price. As to the iodine combination, it is one of a class well known since Herapath's remarkable works. The iodosulphate may be obtained as follows:

1. Sulphate of Cinchonine	1 gramme.
Water	80 grammes.

Dissolve.

2. Iodine	1 gramme.
Potassium Iodide	10 grammes.
Water	1,000 "

The second solution is to be added to the first, but an excess must be carefully avoided. The chocolate-brown precipitate produced is to be collected on a filter, washed until it contains no free iodine, and lastly dried in open air. The result is an odorless, light, impalpable powder, insoluble in water, soluble in alcohol and ether. It contains 50 per cent of iodine, and so far has proved very satisfactory in clinical practice. As an antiseptic it is in no way inferior to iodoform. From a pharmaceutical standpoint it presents the advantage of being easily and inexpensively prepared. — PARIS CORRESPONDENT of *Chem. and Drug.*

Euphorin, or Phenylurethane.

THIS is the name under which the firm of Dr. J. von Heyden is introducing the compound phenylurethane, $CO.OC_2H_5NHC_6H_5$, which was first discovered by Professor Glacosa, of Turin. Henceforth it will be known as "euphorin." It is said to possess antithermic, antirheumatic, analgesic, and antiseptic properties.—*Chem. and Drugg.*

FOLLOWING a practice that has now become frequent, although in the present instance with less than the usual excuse, the trivial name **euphorin** has been bestowed upon the synthetic compound introduced a short time since as **phenylurethane** (*Pharm. Journ.* [3], xx., 501). This compound, which is represented by the formula $CO\begin{matrix}/\,OC_2H_5\\ \backslash\,NH\,(C_6H_5)\end{matrix}$, it may be recalled, is said to be produced by the action of chlorocarbonic ethyl ester upon aniline, and to occur as a white crystalline powder, with a faintly aromatic odor and a scarcely perceptible taste, that subsequently becomes more acrid and somewhat clove-like. It is very slightly soluble in cold water, very freely soluble in alcohol, and sufficiently soluble in mixtures of alcohol and water, such as white wine, to be given in solution in such menstrua.

According to Sausoni (*Pharm. Centr.*, October 9th, p. 616), the urine after the administration of euphorin shows the *p*-amidophenol reaction, either directly or after the distillation of the urine made alkaline by potassium carbonate. Neither phenol nor aniline occurs in the urine, and albumin and sugar are not met with, but probably the secretion of urea is increased.—*Pharm. Journ.*

Azoimid.

Azoimid, a new compound of nitrogen and hydrogen, has been discovered recently by Th. Curtius. This is a most remarkable body, having the properties of an acid, and behaving, in many respects, like hydrochloric acid. Its composition is N_3H, and its constitution may be expressed by the graphic formula:

$$\begin{matrix}N-\\ \|\\ N-\end{matrix}\Big\}\,NH$$

As may be surmised from its composition, it is not a safe article to work with. Indeed, from the statements of the discoverer, it appears to be a most dangerously explosive compound, except perhaps when highly diluted.

The compound is a gas of a most peculiar, "frightfully pungent" odor. Even when highly diluted it causes dizziness and headache, and at the same time produces a violent inflammation of the mucous membrane of the

nostrils. Its aqueous solution, when applied to the epidermis, produces sharp pain. It forms salts which closely resemble chlorides. Thus, the silver salt has the constitution N_3Ag, silver nitride or ternitride; the mercurous salt, $(NH_3)_2Hg_3$, mercurous nitride, or "nitrogen calomel."

The gas is readily absorbed by water. If the aqueous solution is distilled, some of the gas is at first expelled, afterwards a very concentrated, aqueous acid distils over.

The danger connected with handling the new compound and its combinations is illustrated by the fact that 2 C.c. of a 27-per-cent aqueous solution of azoimid contained in a capillary tube exploded, when the tube was about to be closed by fusion, under "frightful detonation and conversion of the thick-walled glass tube into dust." The detonation produced by a few milligrammes of the silver or mercury compound, when heated or struck, is "without parallel" and extraordinarily "quick." The mercury salt explodes in the dark with a brilliantly blue light, that of silver with a green light, and the explosion affords a magnificent sight.

The compounds of azoimid with the alkalies and alkaline earths are not so violently explosive. The barium salt, N_6Ba, which deflagrates quickly with green light when ignited, could be subjected to ultimate analysis (with cupric oxide) without difficulty.

The new compound was produced in the following manner. By the action of hydrazin upon a benzoylglycolic ether (*f. i.*, ethyl-benzoyl-glycolate), there is produced benzoylhydrazin and amidoglycol. Hydrazin has the composition N_2H_4, and benzoylhydrazin is $C_6H_5CO.NH.NH_2$. By the action of nitrous acid (derived from nitrite of sodium by means of acetic acid), the nitrous group is taken up by the benzoylhydrazin and water separated, thus:

$$C_6H_5.CO.NH.NH_2 + HNO_2 = C_6H_5.CO.N\begin{cases}N\\N\end{cases} + 2H_2O$$

benzoylhydrazin — nitrous acid — benzoyl-azoimid — water

The benzoyl-azoimid, when boiled with solution of soda, splits up as follows:

$$C_6H_5.CO.N_3 + 2NaOH = C_6H_5.COONa + NaN_3$$

soda — sodium benzoate — sodium nitride

And the last-named body, when acidulated, produces azoimid, HN_3.—After *Berichte*, 1890, 3023.

The Pharmacy of Exalgine.

At a recent meeting of the Pharmaceutical Society Mr. Peter Boa read the following paper (*Pharm. Journ.*, November 29th):

Exalgine is now frequently prescribed, sometimes in powders, rarely in pills, most frequently in mixtures. When ordered in the form of a mixture, it is nearly always accompanied by a little alcohol in some form or other, such as brandy, rum, alcohol, or an aromatic tincture, with the object of insuring its solution. It frequently happens that the spirit specified in the prescription is insufficient to keep it in solution unless certain precautions be observed.

The solubility of exalgine in water is stated by Martindale in the "Extra Pharmacopœia" to be 1 in 60. For practical purposes this may be accepted. I find that 1 part dissolves in 50 of cold water, but it requires six hours and frequent shaking to effect this. The substance is volatile, and its solubility cannot conveniently be determined by evaporating to dryness a saturated solution. It is readily soluble in warm water, and this property may be utilized in dispensing, as I shall presently show.

The following mixture is the favorite form of a local prescriber:

Exalgine	℥ ss
Alcohol	ʒ ij.
Aquæ	ad fl. ℥ iss.

If the exalgine be dissolved in the spirit and the water then added, it falls out of solution. On the other hand, if the exalgine be dissolved in water by the aid of heat, and the spirit added last, a clear and permanent solution results.

Another mixture by a different prescriber is:

Exalgine	gr. ij.
Alcohol	ʒ ss.
Syr. Aurantii	ʒ iij.
Aquæ	a l fl. ℥ ij.

The spirit here is insufficient to dissolve the exalgine, and, although there is great excess of water beyond the saturation point, I have seen this mixture with a "shake the bottle" on it—an excusable circumstance, because solution would only be effected after some hours in the cold.

The following mixture presents no difficulty at what may be called a comfortable temperature:

Exalgine	gr. xij.
Alcohol	ʒ i.
Aquæ	ad fl. ℥ ij.

If the exalgine be dissolved in the spirit and the water added, a clear mixture is formed. It was prepared on one occasion at a temperature of 46° F., and separation took place. The water had been added gradually; when added all at once, no separation ensued.

Alcohol has a useful effect in keeping exalgine in solution. For example, I dissolved 16 grains in 1 fluidounce of water by heat, and allowed the solution to cool; a copious recrystallization took place. To an ounce of another solution of similar strength, while warm, ʒ ss. of alcohol was added. The solution was permanent. To obtain the best effect from the alcohol, it should not be used to dissolve the exalgine, but added after solution has been effected in the water by heat. The little heat that is required does not appear to change the substance. I compared the crystals obtained from a solution in hot water with the original crystals, and no difference was discernible.

The dose of exalgine generally prescribed is small—usually 1 or 2 grains—and it is not necessary to give it with a deluge of water. When asked to suggest a vehicle, I should say Tinct. Cardam. Co.; it insures solution, covers the taste, and does not possess any therapeutic properties of its own beyond being a pleasant aromatic.

Koch's Syringe for Hypodermic Injections, an illustration of which we present herewith, is likely to be in demand, not only for the use of his anti-tubercular treatment, but in other conditions for which hypodermic medication is indicated. It has the advantage over the piston syringe of being capable of absolute cleanliness. The solutions used come into contact only with the glass measuring tube and the metallic needle, and these can readily be rendered aseptic with heat and absolute alcohol. Instead of a piston, a rubber ball furnishes the means for expelling the solution, and a stopcock prevents any pressure upon the contents until everything is adjusted and ready for the injection. The surgical-instrument manufacturers throughout the country are prepared to supply the demand, the price at present being about $3.50. The syringe sells in Germany for about $1.50. It will probably come to be sold here for about $1 after the novelty wears off.

"Hay Fever," said the Moderator at the Influenza Convention, "may be likened to a tie vote."

"Hear, hear!" cried the audience.

"The eyes and nose both appear to have it."

"Would any shock, at this stage of my trouble, cause a relapse, doctor?" inquired the patient. "Yes, and a serious one." "Please then, doctor, to remember that important fact in making out your bill."

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EDITORIAL.

A Practical Method for Staining Tubercle Bacilli.

SINCE the examination of sputum derived from tubercular patients will no doubt become a universal necessity, a new field is offered to the progressive pharmacist for aiding the physician in his labors. Of course, many of the latter will attend to these examinations themselves, or have them made by younger members of their own profession whose time hangs more heavily on their hands. Yet there are many busy practitioners who have no such assistance. If they can find a pharmacist who is sufficiently expert with the microscope to make such examinations, they will surely employ his services. That this is the case in some parts of Europe, notably Germany, is a fact generally known. Assuming for the present that a practical process for staining and mounting tubercle bacilli will be acceptable to those of our readers who are already in possession of, and familiar with, a microscope, we will quote here a method of proceeding recently published by Dr. M. Friendlaender, of Berlin (in *Pharm. Zeit.*, November 22d). This method permits two mountings to be made in from five to ten minutes, provided the operator is skilled and has everything in readiness.

The materials required are :

1. **Ziehl's Solution.**—This is a 5-per-cent aqueous solution of carbolic acid mixed with alcoholic solution of fuchsin (almost saturated).
2. A mixture of 100 Gm. of alcohol of 80-per-cent and of 5 Gm. of pure nitric acid.
3. A concentrated solution of methylene blue in water.

The mounting is done as follows:

A very small quantity of the sputum—about the size of the head of a pin—is taken up with the needle and spread by means of the latter upon an object-glass to a thin layer about covering the space of a ten-cent piece. The slide is then allowed to dry in the air, and meanwhile a second slide is commenced. The dry mounting is now drawn three times slowly through the flame of a Bunsen burner or alcohol lamp. Next 2 to 3 drops of the fuchsin solution are placed upon the mounting, and the slide held over the flame (mounting upward) until light vapors arise. The slide is now drawn once through water contained in a capsule, and the mounting then treated with a few drops of the acidulated alcohol, which is allowed to remain until the spot is completely decolorized (this will require about one-half minute). The slide is now again washed with water and then treated with a few drops of the methylene-blue solution, which is allowed to remain until the second slide (to which the operator now turns) has progressed to the same point. The first slide is now washed with water and finally dried with blotting paper [this is not advisable unless paper giving off no fibres is at hand] and over the flame.

Upon the mounting there is now placed a drop of oil of cedar (no cover glass), and the object examined with the lens (oil immersion objective).

Usually two specimens or slides suffice for determining the character of a sputum.

THE attention of readers in South Carolina is asked to the communication on page 31 from the Entomologist of the U. S. Department of Agriculture. This department of the government has for some time devoted much attention to the introduction of silkworm raising and the production of silk in this country, and this industry has already been the means of increasing the income acquired by many farmers' wives and daughters. The food supplied to these ravenous caterpillars is a matter of primary importance, and must greatly influence the profitable results of the undertaking. We hope that our readers will promptly inform Mr. Riley of any knowledge they may have of the matter he refers to.

Tobacco Smoke passed through cotton wool charged with pyrogallic acid is said to be freed from nicotine.

Palatable Castor-Oil Mixture.—In the following preparation of castor oil the disagreeable taste of the oil is replaced by a pleasant flavor of almonds :

℞ Castor Oil	30 parts.
Bitter Almonds	2 "
Sugar	30 "
Gum Tragacanth	½ part.
Orangeflower Water	10 parts.
Water	120 "

Mix.

The only drawback to this mixture is that it requires a good deal of it for a dose, a teaspoonful of the oil being contained in about five teaspoonfuls of the mixture.

Observations on Sunburn.—Sunburn on the snow has been the subject of an interesting investigation by Dr. Robert L. Bowles. Alpine climbers concede the curious fact that sun on snow burns more quickly than on rocks or in heated valleys at a low elevation, and Dr. Bowles remarks that sunlight reflected from freshly fallen snow acts much more energetically on the skin than that reflected from older snow. Dr. Bowles one brilliant day painted his face brown, and ascended the Gorner Grat, where there was much snow. There were about eighty others making the ascent. In the evening all excepting Dr. Bowles were smarting from the effects of sunburn. He points out that in Morocco, and all along the north of Africa, the inhabitants blacken themselves round the eyes to avert ophthalmia from the glare of the hot sand. In Fiji the natives abandon their red and white stripes when they go fishing on the reef in the full glare of the sun, and blacken their faces. In the Sikkim hills, also, the natives blacken themselves round the eyes as a protection from the glare of the sun on newly fallen snow. Dr. Bowles concludes that heat is not the direct cause of sunburn, but that it is probably caused by the violet or ultra-violet rays of light which are reflected from the snow.

French Smokeless Sporting Powder.

FOR some years past French Government factories have been supplying dealers with a smokeless powder intended for sporting guns. The composition of the article has recently been improved, and an official publication has set forth interesting particulars on the subject. The new formula is as follows:

Soluble Guncotton	28 parts.
Insoluble Guncotton	37 "
Barium Nitrate	29 "
Potassium Nitrate	6 "

The mixture is first ground while in the wet state, granulated, and dried. Next it is made into a paste with ether, granulated again, and, after drying, the grains are polished in a revolving drum under a spray of ether. After proper sifting and dusting the finished product appears in the shape of a slightly yellow granulated powder, shining, hard, and not hygrometric. The number of grains to the gramme ranges from 2,150 to 2,300. Estimated in volumes, the density of the smokeless powder is about half that of the ordinary black sporting article. It may be used for sporting guns in the same manner and the same measure by volume as common powder.

Such are the official accounts. Gun and powder dealers disagree with them on some points. They admit the perfect smokelessness, light weight, and grain uniformity of the product; but they say that since the Government sells it at twice the price of the old powder—viz., 28 f. against 15 f. a kilogramme—it costs as much in the end. And, worse, they say it is apt to burst gun barrels in very dry weather.

It is but fair to add, some doubt remains as to whether the last statement applies to the old or new improved type of powder, and it is hardly necessary to remark that the smokeless sporting powder is not the smokeless army powder.—PARIS CORRESP. of *Chem. and Drugg.*

Japanese and Newfoundland Cod-Liver Oil in England.

IN 1882 Japanese cod-liver oil was first seen on the London market, and at first it attracted attention and sold at about half the price of the best Norwegian oil, which was just then very scarce.

But soon afterwards, when the Norwegian oil became more plentiful, the Japanese article receded into the background, and its importation no longer paid and was therefore relinquished. Newfoundland oil is also occasionally seen in the English markets, and the low values of cod-liver oil generally during the last few seasons are probably the only reason that it is not imported on a larger scale.—*Chem. and Drugg. Diary.*

Poisoning by Sulphonal.

A CASE is recorded in the *British Medical Journal* (October 25th, p. 905) in which apparently more than an ounce of sulphonal had been taken to induce sleep. The patient died after remaining in a state of stupor, deepening into insensibility and anæsthesia, during three days.

After the evening of the first day there was total suppression of urine, a state which nature evidently made an effort to counterbalance by the production of a profuse perspiration. This appears to be the first case on record of death from an overdose of the drug.—*Pharm. Journ.*

Esterhazy Bouquet.

A FAVORITE perfume has been named after the famous Hungarian prince, which has the following composition:

Calamus	1 ounce.
Cloves	1 "
Nutmeg	1 "
[Deodorized] Alcohol	50 ounces.

Macerate four or five days, filter, and add—

Oil of Lemon	1 ounce.
Essence of Musk	2 ounces.
Essence of Ambergris	4 "
Oil of Bitter Almond	8 drops.
Oil Neroli	16 "
Oil of Rose	38 "
Solution of Ammonia	3 "

Mix. —*Chem. and Drugg.*

BIBLIOGRAPHY.

THE MEDICAL BULLETIN'S VISITING LIST, OR, PHYSICIAN'S CALL RECORD. Arranged upon an Original and Convenient Monthly and Weekly Plan for the Daily Recording of Professional Visits. New Edition. Philadelphia and London: F. A. Davis, Publisher, 1890. $1.25.

Besides twenty-three pages of useful tables and information which may be required in emergencies, this pocket-book contains a novel feature in its arrangement of the call list. For each broad page there are four narrow pages interleaved, so that one entry of a patient's name serves for reference to visits made during an entire month. Each of the large pages will accommodate thirty-four names; and as there are twenty-four leaves, there is provision for sixty-eight individual patients in each month—quite enough for a large business. The usual pages for recording obstetrical, vaccinated, and fatal cases, and for addresses and financial matters, are provided.

THE MEDICAL STUDENT'S MANUAL OF CHEMISTRY. By R. A. WITTHAUS, A.M., M.D., Professor of Chemistry and Physics in the University of the City of New York; Professor of Chemistry and Toxicology in the University of Vermont; Member of the Chemical Societies of Paris and Berlin; Member of the American Chemical Society; Fellow of the American Academy of Medicine, of the New York Academy of Medicine, of the American Association for the Advancement of Science, etc. Third Edition. New York: William Wood & Company, 1890.

"The arrangement and classification followed in previous editions have been continued.

"Those portions of the work dealing with chemical physics and with mineral chemistry have been extended in the light of discoveries announced since the appearance of the second edition.

"The orthography of certain words—as chlorin, chlorids—has been modified in accordance with the views expressed in the report of the committee of the Chemical Section of the American Association for the Advancement of Science.

"That portion of the work treating of the chemistry of the carbon compounds has been much extended and in great part rewritten. The prominence given to this branch of the subject the author believes to be justified, notwithstanding its intricacy and the consequent difficulty of teaching it satisfactorily to medical students, by reason of the intimate connection of organic chemistry with physiology and with modern pharmacy, and the rapidly increasing use of complex organic products, natural and synthetic, as medicines."

ADDITIONS MADE IN 1890 TO THE BRITISH PHARMACOPŒIA OF 1885. Published under the direction of the General Council of Medical Education and Registration of the United Kingdom, Pursuant to the Acts XXI. and XXII. Victoria, Cap. XC. (1858), and XXV. and XXVI. Victoria, Cap. XCI. (1862). Printed and published for the Medical Council by Spottiswoode & Co., Gracechurch Street, London, 1890. Pp. 35, 8vo. One shilling.

The aid of a committee of the Pharmaceutical Society of Great Britain was secured for this supplement, and Professor Attfield has edited it. The forty-four additions embrace a number of proprietary articles, the policy pursued in Great Britain in this respect being contrary to that which exists in the case of the Pharmacopœia of this country.

To Detect Fecal Matter in Drinking Water, Griess recommends a feebly alkaline solution of para-diazo-benzol-sulphuric acid, which, with water contaminated as indicated, will produce a yellow discoloration within five minutes. Try it on the old well next summer.

Two Drops of Creosote made from beech tar, given with a little water, are said to be a specific for hiccough arising from drunkenness.

CORRESPONDENCE.

RAMIE AS FOOD FOR SILKWORMS.

EDITOR OF THE AMERICAN DRUGGIST.

SIR:—I have noticed a newspaper clipping referring to the statement in your journal of the fact that a lady of Columbus, S. C., reared a brood of young silkworms on ramie leaves, for the reason that the worms hatched before the mulberry or osage orange had put forth leaves. It was stated that the worms fed ravenously and were kept upon this diet until the osage orange leaves appeared. The worms were said to have been divided equally, one set being fed with ramie and the other with osage orange leaves, with the result that the former produced larger cocoons and a finer quality of silk.

I wish very much to investigate the truth of this statement, as the discovery is a valuable one, if valid. In spite of the fact that ramie is, botanically speaking, closely related to the mulberry, I am inclined to be incredulous as to the truth of the report. If you can assist me by giving this question circulation, or if any of your correspondents are familiar with the actual facts in the case, I shall be very glad to hear from them.

Yours very truly,

C. V. RILEY, *Entomologist.*

U. S. DEPARTMENT OF AGRICULTURE,
DIVISION OF ENTOMOLOGY,
WASHINGTON, D. C., Dec. 23d, 1890.

MEDICINAL HONEY.

IN the conclusion of a recent letter from Mr. Thomas Christy, of the well-known London house of Thomas Christy & Co., 25 Lime street, regarding a recent discussion of the medicinal value of eucalyptus honey which was held by the Pharmaceutical Society, the writer says:

"Now, what I want your readers to help me with is the following: In a mighty continent like America, bees must feed at certain seasons on flowers or on trees yielding manna, and I am anxious to learn if they know of any honey being collected with a belief that, owing to the bees feeding on certain plants, the honey contains any special properties.

"Mr. Mason, the London partner of Messrs. Seabury, of New York, took a most practical view when he reminded members that any one accustomed to purchase honey knows at once its origin by the flavor. He added that when he was in California he tasted fresh honey from the comb with a strong flavor of orange flowers. So, surely, there must be some properties in honey, although science has not yet discovered a means for detecting an active principle."

If any of our readers can give Mr. Christy information on this subject, it will be greatly appreciated.

NOTES FROM ENGLAND.

(From our own Correspondent.)

LONDON, December 20th, 1890.

The attention of British pharmacists is just now divided between two subjects, each of which is of considerable importance to the craft. Chronologically considered, the Pharmacy Acts Amendment Bill comes first, although it has not yet been introduced into Parliament. It emanates from the Pharmaceutical Society of Great Britain, which represents about one-third of the entire body of chemists, and which enjoys the double capacity of being the only examining body for pharmacists as well as being a teaching corporation. On several occasions the council of the society have framed measures for the furtherance of the interests of pharmacy, but have been unsuccessful in carrying them out, as the majority of the trade are suspicious or inert. The present bill seems to have more chance, as, through the active efforts of the President, Mr. Carteighe, its chief provisions have been explained and the objections battled with at meetings of the trade held at nearly all the principal towns throughout the kingdom. Something like unity in action and concerted combination appears possible. The chief provisions are: The enforcement of a curriculum at a recognized school of pharmacy for all would-be pharmacists; the restriction of the dispensing of all prescriptions to qualified chemists, without, however, interfering with the rights of doctors and veterinary surgeons; the exemption of all chemists from jury service (pharmaceutical chemists alone enjoying the privilege at present).

It is apparent that there are some solid advantages to be derived from such a measure becoming law, and the chief objections are based upon the fact that the bill does not go far enough. The opponents desire to restrict the sale of all drugs to chemists, and not satisfied with that large order, insist on attempting to break up those gigantic monopolies—the stores. The arguments for and against will be considered in my next letter.

The second subject is the publication of the Addendum to the British Pharmacopœia. This is of special interest, as for the first time pharmacists have been officially appointed to assist the General Medical Council in producing this work. This will appear strange to American druggists, who have so long had an important share in the compilation of the national pharmacopœia. Readers of the AMERICAN DRUGGIST will no doubt have an early opportunity of judging the value of these forty-four additions to the British Pharmacopœia. At the commencement of the little book will be found the names of the pharmaceutical chemists appointed by the Pharmaceutical Society to do all constructive work after the Medical Council had decided upon the various drugs. These were: Messrs. Carteighe, Clark, Ekin, Gale, Greenish, Martin, Martindale, and Umney. A word or two about these pharmacists may be of interest. MICHAEL CARTEIGHE, F.I.C., F.C.S., has been described as "the perpetual president of the Society," he having held this position for the last nine years. He is the principal of the old-established firm, Dinneford & Co., of New Bond street, London. The firm are well known everywhere for their "fluid magnesia," which has an immense sale. He has an enormous capacity for work, and much of the present high position of the Society is due to him.

DR. CLARK, D.Sc., F.C.S., is a partner in the firm of Duncan, Flockhart & Co., of Edinburgh. He is also an Examiner of the Pharmaceutical Society in Edinburgh, and has contributed several papers to the *Journal*. He is a firm disciple of Dr. Squibb's method of preparing fluid extracts by repercolation.

CHARLES EKIN, F.I.C., F.C.S., is one of the partners in the historic house of Savory & Moore. This firm's specialties are known through Messrs. E. Fougera & Co., of New York. He was for several years an Examiner of the Society.

H. G. GREENISH, F.I.C., is the recently appointed lecturer on Materia Medica at the Society's school. He is well known as the translator of G. Dragendorff's "Plant Analysis," and was one of his pupils at Dorpat.

N. H. MARTIN, F.L.S., is a member of Council of the Society, and a partner in the firm of Brady & Martin, Newcastle-on-Tyne.

W. MARTINDALE, F.C.S., is also a member of Council, and late Examiner of the Society. He is President-elect of the British Pharmaceutical Conference, which holds a similar position to the A. P. A. He has a great reputation as author of "The Extra Pharmacopœia," which has gone through six editions of 6,000 each since 1882.

C. UMNEY, F.I.C., F.C.S., is a partner in the wholesale firm of Wright, Layman & Umney. Last year he presided over the B. P. C.

It should be added, that this conjoint arrangement of pharmacists and physicians in compiling the additions was due to Professor John Attfield, F.R.S., who is an editor of the B. P., and professor of chemistry to the Society.

The growth of popularity in compressed drugs in England has been wonderfully rapid during the last few years. Introduced first by Messrs. Burroughs, Wellcome & Co., as agents for Wyeth Bros., their manufacture is now undertaken by most of the wholesale houses. Several names have been coined for the purpose of distinguishing

different firms' products. Thus B., W. & Co. call theirs tabloids, whilst pilloids, tabellæ, tablets, and pellets are all names for the same article.

Another innovation hailing from the States, and which has come largely into favor, is the preparation of very small pills. This is due, no doubt, to Messrs. W. R. Warner & Co. in a great measure. A favorite formula here is:

Aloin	½ gr.
Ext. Bellad. Rad	1/20 "
Podophyllin	¼ "
Jalapine	½ "
Ext. Hyoscy	1/20 "
Ex. Nux. Vom	1/15 "
Capsicine	1/20 "

Ft. pil i.

One of the latest improvements in manufacture has resulted in the introduction of chloroform made from pure acetone. This has been in full swing in America for four or five years, I believe, but has only recently been started here. The chloroform is made at Warrington, and the sole agent in London is Mr. A. H. Mason, a partner in Seabury & Johnson's London house. It has already reduced the price to 28 cents, whereas the cheapest obtainable before was from methylated spirit, and charged 44 cents per pound, whilst that from pure alcohol is $1.04.

LONDON MARKET REPORT.

MINCING LANE, December 20th, 1890.

THE closing month in the year is always quiet, and sales have been very small during the last two or three weeks, although money is easier. Heavy chemicals are very firm, whilst at the cinchona sales last week 3,220 bales were offered, and 2,390 changed hands. The unit was raised one-eighth, and prices were well maintained. Oils have been dull, but cod-liver is higher, and slight increases have been made in cotton and linseed. Saffron is low, but will probably rise next month. Shellac shows some slight improvement.

The following are current prices:

Acid, carbolic	per lb., $0.16	Pimento	per lb., $0.05–$0.06
citric	" .32	Oil, castor	per lb., .08
oxalic	" .08	cotton	per cwt., 4.20
tartaric	" .30	linseed	" 6.01
Bleaching powd.,	per cwt., 1.50	olive	" 8.20
Camphor, crude	per lb., .35	turpentine	" 7.90
refined	" .38–.42	petroleum	per gal., .11
Cinchona, Ceylon,	" .10–.16	Potash, bichrom.	per lb., .07½
E. Indian	" .04–:16	chlorate	" .11
Java	" .06–.12	nitrate	per cwt., 4.45
S. America	" .14–.21	Quinine, Aug	per oz., .28
Copper sulphate	per cwt., 4.30	Germ	" .23
Cream of tartar	per lb., .20	Shellac, TN	per cwt., 20.10
Cloves	" .07	garnet	" 19.70
Cinnamon	" .12	button	" 21.30
Jalap	" .42	Soda, caustic, 70°	" 2.80
Mercury	" .50	crystal	" .84
Calomel	" .80	bicarbonate	" 1.72
Corrosive sub	" .64	Stick-lac	per cwt., 16.40–17.70

KANSAS CITY (MO.) ITEMS.

Kansas City has 190 drug stores.

Two hundred and seventy drug clerks in Kansas City.

All the druggists carrying holiday goods report a splendid trade.

GEORGE HASHINGER has opened a new stock of drugs at 2808 Rochester street.

The "Gem Drug Store" has been assigned to MEYER BROS'. DRUG CO.

J. R. BRINKLEY is with L. C. Roy at 12th and Locust Streets.

BROWN & ROBERTS succeed Ed. Marty at Ninth and Wyandotte streets.

MATT REILLY now "supports a handsome pharmacy" at 13th and Summit streets.

ED. M. VANDERPOOL dispenses drugs at the "end" of the Troost Cable.

D. M. CLARCK has removed his stock of drugs from 24th and Belleview to 12th and Harrison.

JAS. TAYLOR, formerly with ED. MARTY, is now at the Post Office Drug Store, Ninth and Walnut.

H. M. GARLICHS, of St. Joseph, paid Kansas City a visit the first of the month, with the view of investing, we understand.

THE MEYER BROS'. DRUG CO. did not carry their usual stock for holiday trade this year. Many retail druggists are following their example.

O'REILLY BROS. have moved their stock from Ninth and Charlotte to the corner room in the Warder Grand Theatre Building.

A heavy snow on the 24th made superb sleighing, and great sales that eve for dealers in articles that Santa Claus makes.

CHARLES W. PARKER, formerly in laboratory of Meyer Bros. Drug Co., is now attending the University Medical College.

J. H. MILLER now dispenses to the poor at the City Hospital. He is a senior student of the Kansas City College of Pharmacy.

There are two lady pharmacists in Kansas City. They are MISS SUSIE HOLZINGER and MISS LOTTA MOSES. Both are students at the College of Pharmacy.

HENRY M. ECTON, who was formerly at Geo. Eysell's drug store, is now in the drug business at Liberty, Mo.

FRANK EDIL, who was pharmacist for the Brown Mfg. Co., is now with E. J. Humphrey, Ninth and Delaware, Leavenworth, Kan.

LESLIE JOY, PH.G., graduate of the Kansas City College of Pharmacy, is now proprietor of the drug store at 15th and Grand avenue.

DR. E. R. LEWIS has just returned from Charleston, S. C., where he has been attending the American Health Association. Our able city physician has secured the next meeting of the Association for Kansas City.

The announcement of the State Board of Pharmacy is creating a sensation among the druggists. They must all have registered clerks by January 10th, or place themselves liable to prosecution.

HACKETT & CAREY have opened a new stock of drugs, with costly fixtures, at 14th and Summit streets. Mr. Carey has many acquaintances in that locality. He was formerly with Riddle Bros.

There are no cut rates in Kansas City. Prices are controlled by the Kansas City Pharmaceutical Association, of which J. A. Gallagher is president and C. C. Griesick secretary. The association meets once a month.

DR. CLAUDE C. HAMILTON, Demonstrator of Chemistry in the Kansas City College of Pharmacy, the University Medical College, and Western Dental College, was married December 1st to Miss Alva R. McKinnon, of Lathrop, Mo.

The Kansas City College of Pharmacy has 54 students enrolled for this term. The faculty justly deserve the wide reputation they have won for their college, which is one of the best in the land.

BEN. C. HOWARD, PH.G., is a graduate of the Kansas City College of Pharmacy, and now the chemist for the Fort Worth (Texas) Cement Co. We miss his face among the many pleasant ones at Woodward, Faxon & Co.'s.

DR. EMORY LANPHEAR, Professor of Materia Medica in the University Medical College and College of Pharmacy, has bought the Fair View Hospital, which will be converted into a home and private hospital for the doctor's patients. Physicians will be glad to learn this hospital is at last in the hands of a "regular."

C. E. CORCORAN, ex-president of the Missouri State Pharmaceutical Association, formerly from the Buckeye State, has been a Kansas City druggist for thirteen years, all of which have been at the old stand, Ninth and Troost avenue. He finds time during the busiest of the holiday season to look after the interests of his association.